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RECREATIONAL CAPACITY IN ESTONIA

REKREATIIVNE MAHUTAVUS EESTIS

Master's thesis

Chair of Landscape Architecture

Supervisor: Professor Simon Bell, *PhD*

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This master's thesis is analysing various recreational areas and researching recreational capacity of the landscape in Estonian outdoor conditions. The aim of the work is to study and analyze how different recreation areas are used, what impact such recreation areas have on nature and how they affect people's choices and preferences. The research method was a combination of a qualitative and a quantitative method, for which three different surveys were conducted – site-based surveys and observations, interviews and an online questionnaire. Results showed that the use of recreational areas is most influenced by location and distance, access to them and various recreational elements. Another important factor influencing the use of recreation areas, which was used to compare different recreational areas, is the availability of different facilities. Such facilities included parking, information boards, toilets, picnic areas, various location-based activities and attractions. Of the different impacts, four major problems have been identified in this work. These included overcrowding, disturbance of natural areas and plants, waste management and wheelchair access to hiking trails, and various paving materials. Such problems can be solved by proper planning and estimating the right size of the crowd, as well as creating opportunities for all visitors to the recreation area.

Keywords: outdoor recreation, capacity, recreation areas, impact, sustainable

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Antud magistritöös analüüsitakse erinevaid rekreatsioonialasid Eestis ja uuritakse maastiku rekreatiivset mahutavust Eesti välitingimustes. Töö eesmärgiks on uurida ja analüüsida kuidas erinevaid rekreatsioonialasid kasutatakse, millist mõju avaldavad sellised puhkealad loodusele ja kuidas need mõjutavad inimeste valikuid ja eelistusi. Uurimismeetod oli kombinatsioon kvalitatiivsest ja kvantitatiivsest meetodist, mille jaoks teostati kolm erinevat uurimust - vaatlused, intervjuud ja veebiküsimustik. Tulemustest selgus, et kõige rohkem mõjutab rekratsioonialade kasutamist asukoht ja kaugus, nendele juurdepääs ja erinevad rekreatsioonielemendid. Teine oluline tegur, mis mõjutab puhkealade kasutamist ja mida kasutati erinevate rekreatsioonialade võrdlemisel, on erinevate rajatiste olemasolu. Selliste rajatiste hulka kuulusid parkimine, infotahvlid, tualettruumid, pikinikualad, erinevad asukohast sõltuvad atraktsioonid ja vaatamisväärsused. Erinevatest mõjudest on antud töös välja toodud neli suuremat probleemi. Milleks olid ülerahvastatus, looduslike alade ja taimede häirimine, prügikorraldus ja matkaradade ligipääs ratastooliga ja erinevad teekattematerjalid. Selliseid probleeme saab lahendada korraliku planeerimise ja rahvahulga õige suuruse hindamise, samuti kõigi puhkeala külastajate jaoks võimaluste loomisega.

Märksõnad: rekreatsioon välistingimustes, mahutavus, rekreatsioonialad, mõju, jätkusuutlik

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INTRODUCTION

Outdoor and nature-based recreation is a cultural ecosystem service that encompasses all physical and intellectual interactions with biota, ecosystems and terrestrial/marine landscapes. This includes a variety of activities, including walking, jogging or running in the nearby greenery of the city, by the river, lake or sea, cycling in nature, picnicking, and watching the flora and fauna. Daily natural recreations are measured as potential visits that people make to enjoy natural amenities that are suitable for everyday activities, such as working, going to school and shopping. It benefits society by increasing people's well-being (Browler et al., 2010; Korpela et al., 2014). Outdoor recreation is part of the cultural ecosystem service and has a positive effect on people's psychological and emotional stress relief (Haines-Young & Potschin, 2012, p. 344).

The topic of this master's thesis is recreational capacity in Estonia, which examine the use of different recreational areas and their functioning, their impact on nature and people's preferences. The aim of the work is to research and analyze the capacity of the landscape for recreational opportunities in Estonian outdoor conditions. In addition to the goal, the research questions would be how different recreational areas are used, how much and what impact such recreational areas have on nature and how they affect people's choices and preferences.

The master's thesis has been divided into four chapters – literature review and theoretical focus, methodology and data collection, research results and analyses, discussion. The first part provides an overview of various scientific articles that present the general concept of outdoor recreation as interpreted by different authors, how outdoor recreation is connected and affects human health, landscape capacity and major issues, such as how man-made sites affect nature as an example of different countries. The second chapter provides an overview of the methodology of the master's thesis, which used site-based survey, interviewing different RMK specialists and online questionnaire. The third chapter presents all the information gathered through site-based surveys, interviews and an online questionnaire. All the collected information is summarized and analysed in the research results and discussion chapter. The fourth chapter concludes with a discussion of the results, observations, interviews, and an online questionnaire.

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I would like to thank my supervisor Simon Bell, who was frequently interested in the development of the work and always answered all my questions very quickly. I would also like to thank Kerli Karoles-Viia, a specialist at RMK, who agreed to gather and answer all the questions asked by RMK during this work.

1. LITERATURE REVIEW AND THEORETICAL FOCUS

1.1. Outdoor recreation

Outdoor and nature-based recreation is a cultural ecosystem service that encompasses all physical and intellectual interactions with biota, ecosystems and terrestrial / marine landscapes. This includes a variety of activities, including walking, jogging or running in the nearby greenery of the city, by the river, lake or sea, cycling in nature, picnicking, and watching the flora and fauna. Daily natural recreations are measured as potential visits that people make to enjoy natural amenities that are suitable for everyday activities, such as working, going to school and shopping. It benefits society by increasing people's well-being (Browler et al., 2010; Korpela et al., 2014).

CES is short for Cultural ecosystem service, which defines non-material and non-consumptive outputs of ecosystem that has an influence to mental and physical state of people (Haines-Young & Potschin, 2012, p. 344). Outdoor recreation is a part of CES and it has a positive impact to physiological and emotional stress relief (Kaplan & Kaplan, 1989; Korpela & Borodulin, 2014; Thompsonet al., 2012). Positive effects are developed while people actively enjoy natural environment and participate different outdoor recreation activities (Fishet al., 2016; Sandifer, Sutton-Grier, & Ward, 2015). How different individuals use natural environment for outdoor recreational activities differ on their social and cultural choices (see e.g., García-Nieto et al., 2015; Gosal, Geijzendorffer, Václavík, Poulin, & Ziv, 2019).

Metropolitan nature environments offer different ways to engage with nature, for example walking, jogging, cycling, sun-bathing, outdoor eating and many other positive influences to psychological and physical health (Bolund and Hunhammar, 1999; Chiesura,2004; Ernstson, 2013; Gómez-Baggethun et al., 2013; Gómez-Baggethun and Barton, 2013).

Green areas are seen as open vegetative areas like parks or gardens (WHO Regional Office for Europe, 2016), while blue areas are natural or manmade outdoor environments that contain some kind of waterbodies – lake, pond, river etc. (Grelliereta l., 2017). There are confirmations

that giving people access to natural green environments, boosts physical activity, psychological well-being and a sense of community (Gascon, Zijlema, Vert, White, & Nieuwenhuijsen, 2017; Nieuwenhuijsen, Khreis, Triguero-Mas, Gascon, & Dadvand, 2017).

1.1.1 Different factors affecting use

Places that appeal to visitor with its own specific scent, look, notable architecture, unusual natural or manmade elements, have a higher aesthetic valuation. Landscapes attributes relation to peoples well-being has to be taken into account also. For example, promoting healthy lifestyle among people is dependent on the health of the natural area itself, the better the natural area is, the more popular healthy lifestyle is among visitors (Wolf and Wohlfart, 2014).
Finding new possible outdoor recreation landscapes which are described by the general outdoor area features that match the interests of local population, contribute to diversion of visitor flows from highly popular recreational areas to new and less visited areas (Othman et al., 2015; De Vries et al., 2013).

Landscape preferences could be bio-physical elements like flora and fauna, cultural heritage and perceptual elements that recreationists find aesthetically pleasing during their visits. Areas that are popular among visitors, could turned into more effective areas by improving infrastructure for recreational use (Shrestha et al., 2007).

An exercise based on photo-ranking and free listing among recreationist, indicated that water elements and forest were highly rated. A degrease of those landscape elements may lower the attractiveness amongst visitors, but that does not mean necessarily a decrease in the number of visitors. Research results show that currently intensively used areas of landscape don't always have attractiveness, saying that it's not the main factor what recreationist are looking for. What also matters, is distance from cities (Zasada, 2011), accessibility (Paracchini et al., 2014), owners of the land (Emborg & Gamborg, 2016) and availability of recreational facilities (e.g., parking areas, gastronomy, walking paths) (Paracchini et al., 2014), landscape preferences (Van Zanten et al., 2014) and the socio-economic profile of the visitors (Howley et al., 2012). These preferences of visitors may vary according to their hobbies, for example, dog walkers look for accessibility, cyclists desire for interesting bicycle trails (Howley et al., 2012).

Recreational opportunities are heavily dependent on the green area's location and accessibility (Massoni et al., 2018; Voigtet al., 2014; Colesand Bussey, 2000; Paracchini et al., 2014), but also on the locations bionic and abiotic conditions, the accessibility of recreational facilities and just the preferences of the local society members (Gómez-Baggethun et al., 2013; La Notte et al., 2017; Manninget al., 2011; Massoni et al., 2018; Voigt et al., 2014).

1.2. Outdoor recreation and health

In many studies, it is implied that individuals who have access to recreational areas tend to be healthier that people who can't access them (e.g. studies by Groenewegen et al., 2006; Khotdee et al., 2011; Maas et al., 2006; Takano, 2007).

Availability of well-maintained and high-quality urban green areas, and neighborhood with safe pavements, help to develop the habit of physical activity while contributing to cleaner air of the area. Well-built and connected network of streets is also linked to more walking and cycling (Pretty et al., 2007).

To change people's habits from treating recreational areas as places they visit only occasionally to public green areas, they want to visit more frequently, it is important to have greener public infrastructure. It has been found, that tendency to be physically active is up to three times higher in areas that have a high level of greenery, and the possibility of being obese or overweight can be 40% lower (Ellaway et al., 2005).

Man-made and natural elements in green areas have been found to affect healthy habits or urban residents. A connection between physical activity levels and location of green areas in nearby neighborhoods and residential areas has also given numerous studies (e.g. Pretty et al., 2007, Humpel et al., 2004). Different types of green areas nearby urban areas such as parks, sport fields and tree avenues allow urban citizens to get the visual and kinetic taste of outdoor environment. They boost citizens active lifestyles and promote healthy behaviors. The opportunity to visit green areas near home, is believed to raise the physical activity of citizens by just going for a walk nearby of the residence status (Pretty et al., 2007).

Recreation in parks (Konijnendijk et al., 2013) and wildland (Thomsen et al., 2018) increases different ways to be physically active and therefore, increases amount of interested citizens and decreases chances to be obese and diabetic or any other health problems related to inactive lifestyle. It has been documented that outdoor recreation reduces stress and anxiety, improves self-esteem, sense of belonging to a group and social cohesion (Konijnendijk et al., 2013; Thomsen et al., 2018) – clear signs of mental health (Jennings et al., 2016).

Research has shown, that spending free time in natural environments increases visitors vitality and energy levels. That improves their state of mind, increasing their performance in every other aspect of life. Recreational areas that give a positive look to life, make people feel more active and alive (Wolf and Wohlfart, 2014; Nisbet et., 2011, Hansmann et., 2007). Aesthetic look of nature has an important role in visitation habits. According to Pfluger (2011), nature must be visually appealing to human eye, to have a positive effect to human behavior and psychology as well. Many recreational and environmental studies have shown that public has highly rated and reacted positively to environments the enjoyed, like native vegetations, elevated areas, areas of water, while giving low ratings to areas that were bushy and seemed frightening (Todorova et al. 2004). Tsunetsugu et al. (2010) found in their research, that humans preference of natural setting environment, is positively affected through five human senses: taste, tactile, visual, olfactory and auditory. Visitors are often more motivated to visit areas, where they could get some clarity to their thoughts and mental relaxation. Also it has been found, that the closer people live to recreational areas, the more frequently they take part in different physical activities in there (Mohd Hisham et al., 2012; Noriah et al., 2014). Katrin et al., (2011) has studied landscape assessments, and found out that, people who do live near pleasing natural environment, are more interested in keeping and taking care of it and they get extra motivation to visit it more often.

1.3. Landscape capacity

Creating a system to measure the capacity of green areas to deliver recreational ecosystem service (RES) is very important but complicated, because recreation is a part of ecosystem service that can be very individual to users. To measure the capacity of green areas to supply recreational ecosystem service and to find the connections between the condition of ecosystems health and service offering capacity, measurement indicators are required (Oudenhoven et al.,

2012; Bastian et al., 2012; Wei et al., 2017). Especially as recreation is an ecosystem service that is based on the preferences and need of individuals, its capacity should be measured by parameters chosen by the participation of society members (Hernandez-Morcillo e al., 2013; Scholte et al., 2018). Multiple authors have suggested many definitions like "information that efficiently communicates the characteristics and trends of ecosystem services" (Brown et al., 2014), and "a measure based on verifiable data that conveys information about more than itself" (Hernandez-Morcillo et al., 2013).

Oudenhoven et al. (2012) classified property indicators as features of the land such as flora, fauna and soil, function indicators related to ecosystem service such as provisioning and cultural service, and service indicators to features that are related to specific ecosystem services like water retention and opportunities for recreational activities like walking. Hernandez-Morcillo et al. (2013) classified CES features by five types, condition, function, intermediate service, benefit and impact indicator.

Many different indicators were used by multiple studies to evaluate recreational ecosystem service supplying capacity. Paracchini et al. (2014), for example used degree of naturalness, protected area and proximity to the coast as a RES capacity indicator. In another study from Pena et al. (2015), the level of naturalness, the existence of protected areas, the existence of waterbodies, the existence of geological interest sites, the characteristics of relief and the existence of mountains, the type of landscape (diverse or homogeneous) and landmarks availability were investigated in relation to the indicator scenic beauty. The capacity can be also measured by the number of visitor per chosen area (Burkhard et al., 2012; Kandziora et al., 2013), biophysical measurements such as area available for the number of visitors per recreational area people (G´omez- Baggethun and Barton, 2013) and a nature preference survey among visitors. Hattam et al. (2015) said that recreational activity indicators for CES used by researchers, such as number of swimmers, number of visitors and participants, could be inaccurate, because they indicate human preferences not the state of ecosystem.

Distance from residential areas and potential supply was used to determine capacity. Poelman's (2016) methodology was used to calculate the distance from residential area, to estimate walking accessibility. Only pedestrian accessibility was taken into account as it is the only mode of transportation available to the whole population. Areas that were more than 30-minute walk away were not counted.

1.4. Problems/damages

Changes to landscape, that are made by humans, has caused huge changes in the global placement of organisms (Vitousek et al., 1997).

1.4.1. Damage for nature

Waterbodies (beaches, lakes, rivers)

Recreational use of wet areas has increased in recent years, as many activities such as fishing, water sports, bird watching, sunbathing on beaches and exercising has become more popular among recreationists. All these activities are extra pressure on the ecosystem of waterbodies. Although everybody knows the positive effects of tourism – improvement of personal well-being, boost to local economy, it also comes with a downside - danger to lake ecosystem (Monz et al., 2013; Venohr et al., 2018).

Unfortunately, there is not much information available how beach visitors influence the habitats and the biodiversity of waterbody (but see Brauns et al., 2007).

To create attractive beaches, where people could sunbath, swim and play sports, cleaning shoreline is seen as essential step. Shoreline flora, such as reed or other submerged macrophytes have their own structure and importance in ecosystem (Cheruvelil et al., 2000; Varga, 2001). So cleaning the shoreline from vegetation may cause changes in habitats and could be fatal or change the structure of some organisms that were dependent on vegetation (Cheruvelil et al., 2000; Varga, 2001).

Besides problems related to creating new beaches, visitors can disturb organisms living in benthic zones also by treading. Despite multiple experiments performed to find the impact of trampling to headwater systems, many analyzes found negative impact of trampling to headwater stream systems (Escarpinati et al., 2014) or neutral impact (Bossley and Smiley, 2018).

Forests (hiking trails, camping sites)

Nature based tourism (NBT) is built and dependent on the nature experience, attractiveness and available activities, that sets the recreational quality of natural environment (Tyrväinen et

al., 2008, 2017a; Margaryan, 2018). Nordic countries have everyman's right, which means that everybody have free access to all nature areas (Kaltenborn, et al., 2001; Sandell and Fredman, 2010) and gives an important role to private forests. Areas where wood production is intensive, short rotation forestry and large forest management practices are typical practices. As its normal for industry, it could negatively affect tourism as it may change landscape quality. Tourists who come for nature experience, want to see natural looking, beautiful and authentical natural environments (Tyrväinenet al., 2001; Uusitalo, 2017). Studies have shown that tourist prefer matured forests, that have some undergrowth, good visibility and not many obvious sign of forest management (e.g.Ribe, 2009;Gundersen and Frivold, 2008; Tyrväinen et al., 2017a; Silvennoinen, 2017). In comparison, any traces of cutting or regeneration cutting, soil works, or logging residues lower the recreational quality of forest. Because of that, adaptive landscape management techniques are used in areas and trails or paths nearby recreational or tourism visitors (e.g.Juutinen et al., 2014,2017).

It has been found, that leisure, sports and tourism activities are causing a changes in natural ecosystems all over the world (Mcdougall and Wright, 2004; Perevoznikova and Zubareva, 2002; Atik et al., 2009; Whinam et al., 1994). For example, human related activities often put ecosystem under pressure (Pickering and Hill, 2007; Monz, 2002; Zhang et al., 2015), with activities hiking, cycling, horseback riding, recreationists often tend to wander away from designated trails and damage the vegetation by trampling (Barros et al., 2020; Goh, 2020; Park et al., 2008). Vegetation could be damaged in multiple ways, like declining biomass, trash, cover, species composition and richness (Ballantyne et al., 2014; Monz, 2002; Pickering and Hill, 2007). 42% of IUCN Red List European vascular plants across 50 families (70% of them are herbs) are threatened by recreational activities and tourism (Ballantyne and Pickering, 2013). Even more, visitors may cause damage to biomass, height of vegetation, changes in species composition, creation of unofficial trails, weeds and plant pathogens increase in vegetation (Barros et al., 2013; Farrell and Marion, 2001; Pickering et al., 2010). Effects to nature are not always negative, for grasslands, proximity to trails has shown a positive effect on spices richness (Kostrakiewicz-Geralt et al., 2020). Trampling doesn't only cause changes in vegetation, but could also cause soil hydrology change, widening of the trail, exposure of rocks, roots and bedrock, soil erosion and compaction trails (Mcdougall and Wright, 2004; Dunne and Dietrich, 2011).

As the demand for outdoor recreational areas is growing, it puts some extra pressure to urban areas near bigger cities. In the Netherlands, the Dutch government has been suggested to equally distribute recreationist to avoid overcrowded recreational areas. To create strategies about redirecting recreational activities, there is a need for reliable data analysis on areas that are popular among people and what new areas could be suitable for recreational activities.
The growing usage of recreation in peri-urban areas sets the landscape in danger as there is a threat to qualities like biodiversity and calmness of nature (Almeida et al., 2016; Zlender and Ward Thompson, 2017). Changes triggered by recreational areas are often related to modifications in wildlife, vegetation and water resources (Dynowski et al., 2019; Arriaza et al., 2004).

Biodiversity on national parks can be threatened by uncontrolled use of recreational area, poor management or mistakes in initial planning (Cole et al., 1996). Even if the area is managed properly, national parks are often underfunded and lacking of qualified personnel (Bernard et al., 2011, Iojă et al., 2010).

1.4.2. Access

Green areas should have functional and structural diversity – visitors with different values and preferences should all have equal access to recreational areas. Also there has to be an elegant balance between man-made and natural facilities, but the main goal is still to make sure that any part of the sociality won't be left out (Suárez, Barton, Cimburova et al., 2020).

Accessibility is a quality of the area or the individual person (Kwan, Murray et al., 2003). It is considered as an essential component in every area of life, for example accessibility must be taken into account, when planning - access (Hare, Barcus et al., 2007; Gesler, Meade et al., 1988), public transport networks or management of protected areas (Salonen et al., 2012). Most frequently access is described with path/road surface (paved, gravel, forestry, trail) and the means of access (car, bike, on foot) (Salonen et al., 2012).

Settings standards in access laws, is done by specialists who design and manage the infrastructure. They can take natural aspects, design, maintenance and usage rules into account when facilitating or restricting access (Stankey et al., 2005). Accessibility definition varies according to the purpose. Moseley (Kalba et al., 2008) defines accessibility not by the place

itself, but by people and experiences they want. He highlighted the role of accessibility in geographical, social and economic context. Department of the Environment lists accessibility as convenience and facility to accomplish moving from one place to another. It may be different depending on the purpose and the way of travel. Mostly accessibility can be a measured through the distance of start and end, time spent for that movement (Verburg, Overmars et al., 2004) or the benefits available from that move (Cole, Landres et al., 1996).

When planning in protected areas, there is a strong link between sustainability and accessibility. Bayarsaikhan et al. Bayarsaikhan (et al., 2009) points out the role that standards of management and design have, to establish access categories to certain areas, and tourism should benefit from sustainable economic and environmental requirements (Worboys, Lockwood et al., 2001). To increase the negative impact of sustainability to protected areas, the development of accessibility policy should take social, economic and environmental properties into account (Marshall, Banister et al., 2000).

When choosing a destination, tourist often take accessibility into account when making a destination. It may not be most important, but when multiple places have similar attractions, it may direct the decision from one destination to another. National parks infrastructure information is not only useful for visitors, but also managers and public servant, who monitor the trail usage, quality and plan the budgets (Chiou, Tsai et al., 2010).

Current recreational areas should be properly managed – that means changing some trails, adding infographics, improving infrastructure in accordance with visitors demand, protection objectives or currently available facilities (Tomczyk et al., 2011). Park managers should implement laws to guarantee sustainable management (Pickering, Hill et al., 2007). For example, visitors should be given information based on nature protection goals. The purpose of national parks is not only preserving species or habitants but also to provide equal access to recreational activities for locals and tourist (Mullick et al., 1993).

Taking into account all the benefits associated with access to outdoor recreational areas, city planners and government should make sure that all different social groups of population has access to regular outdoor physical activity, promoting active lifestyle and stress reduce (World Health Organization, 2018).

2. METHODS

2.1. Research methods

This chapter describes the different methods used to collect data to compile this thesis. The research method was a combination with qualitative and quantitative method, which used three different techniques – site-based survey and observation, interview and online questionnaire.

1) **Site-based survey** – several observations in various places of recreation areas in Estonia (forests, bogs, beaches, swamps, beaches) and also observation of people behavior in these places.
2) **Interviewing/questioning** – as research by different RMK professionals involved in management of diffeerent recreational areas
3) **Online questionnaire** – 16 questions, surveys on people's usage patterns and the popularity of sites.

2.2. Data collection

The site-based survey took place from March 2020 to February 2021, during this various Estonian recreation places, forests, bogs, beaches, hiking trails and sports fields were visited. A total of 60 sites were visited, of which 41 were pointed for the results of this master's thesis. The observation sites were selected according to 4 different regions of Estonia - Northern Estonia, Southern Estonia, Eastern Estonia and Western Estonia. Next, they were divided equally between different types of recreation. This means that the first part compared different beaches and waterbodies, such as different seas, lakes and rivers. In the second part, different recreation areas in the forests were compared, ie. different hiking trails and camping sites. In the third part, the bogs of different regions were compared, and in the fourth part, recreational areas with active use were pointed out, which were various sports facilities, adventure parks and winter sports facilities. The observation places and recreation areas highlighted in the results were selected according to the popularity of the area.

Different characteristics were used to analyse the different types of recreation outlined above, such as location, distance from the closest city, distance from Tartu and Tallinn, nearest bus and train stop, nearest food and accommodation, accessibility by car and accessibility by wheelchair or pram, different attractions and facilities.

Location

The location was indicated with the county and city accuracy, as well as the exact type of the given recreation.

Distance from the closest city

Distance from the nearest town or settlement, for example, during the observation such recreation areas near smaller cities as Rakvere, Pärnu, Narva, etc. were visited. Such a comparison makes it possible to analyze whether that people visit more areas close to larger cities or whether people also visit places further away from such small towns and settlements. Google Maps (March 2021) was used to analyze the data, the data was collected in kilometers.

The distance from Tartu and Tallinn

The distance from the largest cities in Estonia also gives an overview of whether the most popular places to visit are closer to larger cities. Google Maps (March 2021) was used to analyze the data, the data was collected in kilometers.

Nearest bus and train stop

Shows if there are and how far the most important bus and train stops are for people, who do not have a car and want to use public transport to get to recreation areas. Their distances from a given type of recreation are also shown. Google Maps (March 2021) was used to analyze the data, the data was collected in meters.

Nearest food and accommodation

Shows if there are and how far away are the nearest places to eat and to spend the night, for those who want to stay longer to visit this recreation area, or if there is no campfire site or camping facility in these places. Google Maps (March 2021) was used to analyze the data, the data was collected in meters.

Accessibility

Shows how the recreation area is accessible either by car or people with disabled people or with a people with pram, for example, the material of the road surface was highlighted, whether the area can be accessed from the road or a side road.

Attractions

Indicates whether there are various facilities available in the area, such as playgrounds, gyms, rental sites, hiking trails and observation towers.

Facilities

Indicates whether the area has the most important facilities for visiting the recreation area, such as parking, information boards, toilet facilities, picnic areas, changing rooms on the beaches, etc.

The next research method was interviewing various RMK specialists who deal with the management and organization of various recreational areas. Questions were sent to a total of seven nature use and visitor management specialists, including planning and monitoring specialists, site managers, information managers and nature trail specialists. The total number of interview questions was 13. Questions were sent via email. The answers to the questions are presented in chapter 3 of this master's thesis. The prepared questions are presented in the appendices of this work.

The last, third research method was an online questionnaire, consisting of 16 questions. The questionnaire was compiled using Google Docs Forms and distributed to people via social media. The results of the questionnaire were analyzed and the charts were compiled using MS Office Excel. The questionnaire consisted of 16 questions, of which 12 were multiple-choice and 4 were free-form. The questionnaire examined which areas of recreation people prefer to use in Estonia, what are the favorite activities there, what the choice of destination depends on how people are getting there, and what are people's favorite places for different type of recreational areas. The results of the answers were presented with diagrams, pie charts and their descriptions in chapter 3.3 of this master's thesis. The questionnaire was public in February and March. Respondents were selected from different age groups, ranging from 18 to over 50 years. The survey tried to collect answers from different age groups of people as well as different genders in order to have more respondents with different interests and preferences. The

questionnaire was anonymous and people were sent a Google Docs link to answer these questions. More detailed questions are presented in the appendixes of this work.

3. RESULTS

This chapter presents all the material collected for this master's thesis and divides it into four subchapters. These include site-based observation, problems and damages, RMK interviews and people's questionnaire answers.

3.1. Results of observations

One part of the research of this master's thesis was a site-based survey and observations. The surveys took place from March 2020 to February 2021. During the observations, information was collected on 4 different types of Estonian recreation areas, which were beaches/waterbodies, forests, bogs and recreational areas with active use. All areas are in turn divided into regions - Northern Estonia, Southern Estonia, Western Estonia and Eastern Estonia. The 3 most popular recreation areas and places to visit (if possible) from each region are listed in the tables. All data have been collected through site-based surveys and various Puhka Eestis and RMK websites (Puhka Eestis, 2021; TOP 10 matkarada, 2021; TOP 10 parimat randa Eestis, 2021; Loodusega koos | RMK, 2021).

3.1.1. Beaches and waterbodies (seas, lakes, rivers)

Table 1. North-Estonia beaches and waterbodies descriptions

	Location		
Attribute	Võsu beach	Pirita beach	Laulasmaa beach
Distance from the center	Nearest city: Rakvere 36 km, Tallinn 99 km	Nearest city: Tallinn 6,5 km	Nearest city: Tallinn 37 km
Nearest bus and rain stop	280 m, centre of Võsu	350 m	350 m
Nearest food and accommodation	Few hundred metres, nearby area	less than 2 km, same city	less than 2 km, nearby
Accessibility	signs available, highway	signs available, highway	signs available, highway
Attractions	Ball game fields, playground, outdoor gym, pump track	Ball game fields, playground, kiosks	Ball game fields, wind surfing, kae surfing and SUP
Facilities (parking, information, toilet	Accessible for wheelchair, parking,	Accessible for wheelchair, parking,	Not accessible for wheelchair (narrow

facilities, picknicking, changing rooms etc.)	changing rooms, several toilets, picnic area	changing rooms, several toilets, picnic area	boardwalk), parking next to Laulasmaa Spa Hotel, changing rooms

North-Estonia beaches and waterbodies are mostly located next to sea, these area generally white sandy beaches with a wide coastline area. Most beaches and swimming areas are surrounded with pine forests and have fine beach sand. The coastal areas of Northern Estonia have generally all a sunbathing area, changing rooms, some also have a play area (volleyball and a playground for kids) and in some cases there is also smaller harbors next to beach. During the observation, the beaches of Võsu, Käsmu, Vergi, Vainupea, Kunda, Vääna-Jõesuu, Laulasmaa and Pirita have been visited. For comparison, the most popular beaches in the area were used. Võsu, Käsmu, Pirita beaches are best equipped with toilets, changing rooms and little cafes, because they are also visited by a larger number of people in these areas. Võsu, Käsmu and Kunda beach also have a boat dock that only serves smaller private boats. The beaches of Võsu, Pirita, Lasulasmaa and Vääna-Jõesuu are most crowded, because they are located closer to larger settlements such as Rakvere and Tallinn cities.

Table 2. South-Estonia beaches and waterbodies descriptions

	Location		
Attribute	Verevi lake	Pühajärve lake	Tamula lake
Distance from the center	Nearest city: Tartu 26 km	Nearest city: Otepää 2,9 km, Tartu 46 km	Nearest city: Võru 20 m, Tartu 76 km
Nearest bus and rain stop	220 m, next to beach	400 m	1,8 km
Nearest food and accommodation	Close by, several in city of Elva	In city of Pühajärve	On the beach and city of Võru
Accessibility	Signs available, next to highway	Signs available, next to highway	Signs available, small side streets
Attractions	Diving tower, beach volleyball courts, children's swimming area, trail slide across the lake	Pier, beach volleyball courts, playgrounds, paddle boat and water bike rent	Foot- and volleyball courts, playgrounds, 800 m beach promenade, watercraft rent
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Information boards, parking in big parking lot or several parking places next to road, toilets, changing rooms, swings, benches	Accessible for wheelchair, information boards, big parking lot, picnic area, changing rooms, toilets	Accessible for wheelchair, information boards, parking in side streets, picnic area

South-Estonia beaches are mostly by the rivers and lakes, these are mostly sandy and grass covered beaches. Sun-bathing areas are both in grass/sand and also in different platforms over

the lakes. During the observation, the beaches of Pühajärve, Arbi, Viljandi, Pedeli and Verevi lakes were visited. For comparison, the most popular beaches in the area were used. Verevi, Pühajärve and Tamula lake are most crowded, mostly people go to Verevi lake from Tartu, to Pühajärve beach from Otepää and Tamula beach from Võru city.

Table 3. West-Estonia beaches and waterbodies descriptions

	Location		
Attribute	Pärnu beach	Mändjala beach	Paralepa beach
Distance from the center	Nearest city: Pärnu 2,7 km, Tallinn 130 km, Tartu 175 km	Nearest city: Kuressaare 12 km, Tallinn 229 km	Nearest city: Haapsalu 2,5 km, Tallinn 101 km
Nearest bus and rain stop	1,6 km	550 m	350 m
Nearest food and accommodation	Many close by in beach area and city of Pärnu	Nearby, Mändjala camping and most in Kuressaare city	Nearby hotel and many in Haapsalu city
Accessibility	Signs available, small side streets	Signs available, highway, trail through the forest	Asphalted pathway and walkway
Attractions	Many playgrounds for kids, beach volleyball courts, minigolf, long beach promenade, different bikes rental, surf and SUP equipment rental	Beach chairs and hammocks swings hanging between pine trees	Playground, volleyball court, watercraft rental
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Accessible for disabled users, 4 different parking places, 2 bigger buildings for toilets, changing rooms	Not accessible for disabled users, information boards bigger parking lot, changing room, toilets	Accessible for wheelchair, parking lot in 700 m, changing room, toilet and picnic area

West-Estonia beaches also mostly located next to sea, these are mostly sandy beaches and west coast include many different islands and their beaches. During the observation the beaches of Pärnu and Valgeranna were visited. For comparison, the most popular beaches in the area were used. Most people go to Pärnu beach from Pärnu city and all overall Estonia, because it is most known beach in Estonia, because of its wide sandy beach front, long promenade and different beach hotels. Mändjala beach is located on the largest island in Estonia - Saaremaa and to Mändjala beach, people are mostly coming from Kuressaare city and different places from Saaremaa. Paralepa beach visitors are coming from Haapsalu city.

Table 4. East-Estonia beaches and waterbodies descriptions

	Location		
Attribute	Peipsi lake (Kauksi beach)	Sillamäe beach	Narva-Jõesuu beach
Distance from the center	Nearest city: Mustvee 26 km, Tartu 86 km	Nearest city: Sillamäe 2,3 km, Tallinn 186 km	Nearest city: Narva 16 km, Tallinn 202 km
Nearest bus and rain stop	1 km	300 m	1,7 km
Nearest food and accommodation	Nearby Kauksi Camping site and different holiday houses along roadway next to lake	Nearby in Sillamäe city	Nearby in Narva - Jõesuu and Narva city
Accessibility	Access by highway with car and on promenad by wheelchair	Accessible by wheelchair, by car from side streets, information boards	Not accessible by wheelchair, signs available, highway
Attractions	Volleyball, playground, swings, campfire and camping sites	Long beach promenade, watching tower, wooden platforms, ball fields, playgrounds, campfire sites, outdoor gym	9,5 km long beach coast, beach volleyball, playground, campfire sites
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Big parking lot in 270 m, information boards, changing rooms, toilet, campfire and camping sites	Parking in side streets, information boards, picnicking	Paid parking, information boards, toilets and outdoor shower, changing rooms

During the observation the beaches of Sillamäe, Valaste, Peipsi and Kallaste were visited. For comparison were used the most popular beaches in the area. Valaste beach is more as a part of a hiking and learning trail, where you usually walk or take pictures and move back up. The shores of Lake Peipsi or Kauksi are visited by people from Ida-Virumaa and also by people from Tartu County. There are changing rooms, a restaurant and water sports facilities, as well as campsites for overnight stays. Lake Peipsi is also used by many fishermen.

Figure 1. Use of beaches (Käsmu beach, Pärnu beach, Verevi lake, Valaste). Author's photos.

3.1.2. Forest (hiking trails, camping)

Table 5. North-Estonia hiking trails descriptions

	Location		
Attribute	Keila-Joa nature trail	Oandu	Käsmu
Distance from the center	Nearest city: Tallinn 31 km	Nearest city: Rakvere 32 km, Tallinn 86 km	Nearest city: Rakvere 42 km, Tallinn 79 km
Nearest bus and rain stop	350 m	350 m	200 m
Nearest food and accommodation	Close by Keila-Joa Manor	In Sagadi Manor or small city Altja	Food: nearby, in Käsmu village Accommodation: no campsite in Käsmu, nearest Võsu campsite
Accessibility	Not accessible by wheelchair, highway	Not accessible by wheelchair, parking for 10 cars, signs available, highway	Not accessible by wheelchair, different beaches
Attractions	3 km walking trail, waterfall, stairs, bridges, 8 history introducing points	4,7 km hiking trail, camping area, picnic area	15 km hiking trail, swings
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Parking, toilet, picnic area, information boards	Parking for 10 cars or 2 buses, camping site, picnicking, toilets	2 parking lots, information boards, picnicking, toilet

North-Estonia hiking trails are mostly in forest, some next to seaside and in Lahemaa national park. For comparison, the most popular hiking trails in the area were used. Keila-Joa nature trail is located in Harjumaa, Oandu and Käsmu hiking trails are located in Lääne-Virumaa. Dominant road surface in these hiking trails was a forest road and none of these paths are accessible with wheelchair. Overall infrastructure and furniture are good, all trails have at least parking space for 10 cars, information boards and picnic area.

Table 6. South-Estonia hiking trails descriptions

	Location		
Attribute	Taevaskoja	Vapramäe	Hinni kanjon (canyon)
Distance from the center	Nearest city: Põlva 5,2 km, Tartu 44 km	Nearest city: Elva 6,6 km, Tartu 21 km	Nearest city: Võru 14 km, Tartu 78 km
Nearest bus and rain stop	Bus: 400 m Train: 1,9 km	Bus: 90 m Train: 1,9 km	Bus: 850 m
Nearest eat out and accommodation	Taevaskoja holiday centre 2,4 km	Vapramäe Guesthouse 270 m	Closest: in Rõuge city 5,8 km
Accessibility	Accessible by wheelchair until Väike Taevaskoda (gravel	Not accessible by wheelchair, signs available, highway	Not accessible by wheelchair, approach rather complicated,

	path), well maintained approach from highway, well informed signs		helped various instructions online and some signs
Attractions	3 km hiking trail, Suur and Väike Taevaskoda sandstone outcrops, caves	3,5 km hiking trail, campfire site, picnic site	200 m trail, 15-20 m steep sandstone outcrops, Rõuge primeval valle hiking trail 10 km
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Parking for 30 cars, information boards, fences, stairs, picinic area, toilets and 1 inva toilet	Parking, information boards, toilet, picnic area	Parking for 6 cars, information boards, 1 toilet, stairs, benches

South-Estonia hiking trails are located in forest. Taevaskoja is located in Põlvamaa, Vapramäe in Tartumaa and Hinni kanjon in Võrumaa. For comparison, the most popular hiking trails in the area were used. In all of these trails are two kind of road surface, wooden path and also forest road. Infrastructure and furniture are also good, Taevaskoja have parking for 30 cars, but it is frequently visited place and need a large parking lot. All 3 trails have toilet facilities and only Taevaskoja hiking trail have accessibility for disabled users and 1 inva toilet.

Table 7. West-Estonia hiking trails descriptions

	Location		
Attribute	Harilaiu	Penijõe	Pärnu coastal meadow
Distance from the center	Nearest city: Kuressaare 50 km, Tallinn 265 km, Tartu 379 km	Nearest city: Haapsalu 53 km, Tallinn 112 km	Nearest city: Pärnu 3 km, Tallinn 130 km
Nearest bus and rain stop		Bus: 350 m	Bus: 400 m and 1,6 km
Nearest food and accommodation	Vilsandi national park visitor center	Nearest 3 km and in Lihula city 4,1 km	Several places next to Pärnu beach, 300 m
Accessibility	First highway and then side roads, most of road with car, then by foot, not accessible by wheelchair	Not accessible by wheelchair, highway, signs available	Accessible by wheelchair, from the roadway of Pärnu city and Pärnu beach
Attractions	6 km and 10 km trails, lighthouse, camping site	3,2 km, 4,7 km, 5 km, 7 km hiking trails, 8 m high watching tower, 2,5 m high viewing platform	600 m hiking trail, watching tower, flooded meadows, next to Pärnu beach
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Parking for 5 cars, information boards, toilet, camping site	Parking for 14 cars, information boards, several roofed resting areas and picnic area	Parking in otherside of trail next to houses and apartments area and in Pärnu beach

			parking lot, information boards, toilets in Pärnu beach,

West-Estonia hiking trails are located in forest and also some next to seaside. For comparison, the most popular hiking trails in the area were used. Harilaiu is located in Saaremaa, Penijõe is in Matsalu national park and Pärnu coastal meadow hiking trail in city of Pärnu, next to Pärnu beach. Road surface in Harilaiu is forest road and in Penijõe and Pärnu wooden boardwalk and only Pärnu coastal meadow hiking trail is accessible by wheelchair. Overall infrastructure and furniture is good, parking place capacities are bigger in Penijõe and Pärnu, with more than 10 parking spaces.

Table 8. East-Estonia hiking trails descriptions

	Location		
Attribute	Valaste	Kauksi oja	Vaivara
Distance from the center	Nearest city: Narva 54 km, Tallinn 159 km	Nearest city: Mustvee 26 km, Tartu 86 km	Nearest city: Narva 23 km, Tallinn 188 km
Nearest bus and rain stop	Bus: 130 m	Bus: 1,2 km	600 m
Nearest food and accommodation	Valaste Guest House and Camping 20 m	Kauksi Holiday Village 3,2 km	Nearest in Sillamäe city 4,7 km
Accessibility	Not accessible by wheelchair, lot of stairs, next to highway, signs available	Not accessible by wheelchair, highway, signs available	Not accessible by wheelchair, highway, sisgn available
Attractions	1,5 km hiking trail, 55 m of descent in stairs, Valaste Waterfall, cliff forest and Ontika limstone	3,6 km nature trail, Kauksi oja valley, lot of pine trees, Peipsi lake	8 km history trail, different war related elements
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Parking for 15 cars, next to highway, starting of trail, information boards, toilet	Parking in next to visitor centre, information boards, toilet	Parking, information boards, picnic area

East-Estonia hiking trails are located in forest, by the sea or by the river. For comparison, the most popular hiking trails in the area were used. Valaste is located in Ida-Virumaa, by the sea, Kauksi is located in nearby Peipsi lake and Vaivara nearby Narva-Jõesuu city. In these 3 hiking trails none of these paths are not accessible by wheelchair. Overall infrastructure is better in Valaste hiking trail, there is more parking spaces for over 10 cars and many information boards and picnic area.




Figure 2. Use of hiking trails (Riisa, Valaste, Pärnu, Riisa). Author's photos.

3.1.3. Bogs

Table 9. North-Estonia bogs hiking trails

	Location		
Attribute	Kakerdaja	Viru	
Distance from the center	Nearest city: Rakvere 67 km, Tallinn 73 km	Nearest city: Rakvere 49 km, Tallinn 53 km	
Nearest bus and rain stop	Bus: 10 km	Bus: 850 m	
Nearest food and accommodation	Valgehobusemäe Ski- and Recreation Center 13 km	Viitna recreation center 24 km	
Accessibility	Not accessible by wheelchair, highway and forest road, signs available	Accessible by wheelchair, Tallinn – Narva highway, signs available	
Attractions	7 km bog hiking trail, Kakerdaja lake, campsite area	6 km bog hikingtrail, watching tower, campfire site	
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	2 parking lots for 18 cars, 3 information boards, toilets, 3 campsite areas	Parking for 10 cars, information boards, toilets and 1 disabled user toilet, picnic area	

Among the bogs of Northern Estonia, 2 most popular were brought out, which are Kakerdaja bog and Viru bog. Both are located in the 50-70 km range compared to larger cities nearby, such as Rakvere and Tallinn. The nearest bus stop was located near Viru bog, only 850 m, which can be reached on foot, the bus stop of Kakerdaja bog was located several km away. The nearest catering establishments and accommodation establishments were located between 13 and 24 km, which definitely requires transport. In the comparison of access, the Viru bog is more accessible, because it is easier to reach it via the Tallinn - Narva road and several signs lead to the location. In addition to the road, the Kakerdaja bog also passes several forest roads. In addition, the Viru bog is wheelchair accessible. At the same time, Kakerdaja bog has a better

possibility to park cars, ie 2 parking lots for cars that can accommodate 18 cars. Both bogs are equipped with waters and picnic areas.

Table 10. South-Estonia bogs hiking trails

	Location		
Attribute	Meenikunno		
Distance from the center	Nearest city: Võru 33 km, Tartu 75 km		
Nearest bus and rain stop	Bus: Verioramõisa 4,5 km Train: Verioramõisa 4,4 km		
Nearest food and accommodation	Food: Süvahavva 18 km Accommodation: Liipsaare forest hut next to trail		
Accessibility	Access by wheelchair from Päikeseloojangu forest house until lake, 1,1 km, highway, signs available		
Attractions	5,8 km hiking trail, watching tower, campfire site		
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	2 parking lots, both side of trails, for 20 cars, information boards, toilets, picnic area		

The Meenikunno bog has been identified from the South Estonian bogs, it is located a bit further from the larger cities, ie. 33 and 75 km away, and also the nearest bus stop is 4.5 km away, which means that you definitely need to use a car or public transport to get there. The nearest place to eat out is 18 km away and housing can be used near the Liipsaare forest hut trail. Access to the bog is from the highway and there are also several leading signs as well. Wheelchair access is at the Sunset Forest House to the lake, the bog road will be narrower and there will be no road barriers on the sides of the bog road. There is a 5.8 km long bog trail on the trail, an observation tower on one side of the trail entrance and several campfire sites. Of the necessary facilities, Meenikunno bog has 2 larger parking lots for 20 cars, large information posts with information in Estonian, English and Russian. Toilets are on both sides at the entrance to the hiking trail. There are also decent campfire sites on both sides.

Table 11. West-Estonia bogs hiking trails

	Location		
Attribute	Riisa	Koigi	
Distance from the center	Nearest city: Viljandi 52 km, Tartu 132 km	Nearest city: Kuressaare 50 km, Tallinn 175 km	
Nearest bus and rain stop	Bus: 900 m	Bus: 5 km	
Nearest food and accommodation	Ritsu guest house 3,3 km	Tohvri Tourism Farm 6,6 km	
Accessibility	Accessible by wheelchair (not in winter), highway, signs available	Not accessible by wheelchair, access by car through the village road	
Attractions	4,8 km hiking trail, resting places, watching tower	5 km hiking trail, 3 m watching tower, viewing platform, 3 bridges	
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Parking for 10 cars, information boards, 4 toilets, 2 for disabled users, resting area	Parking for 20 cars, information boards, toilet, 3 benches	

From the West-Estonian bogs Riisa and Koigi bogs have been pointed out, Riisa is located near the cities of Viljandi and Pärnu and Koigi is located in Saaremaa. The nearest major cities in both bogs are within 50 km. The nearest bus stop to Riisa is 900 m away, which also allows walking, but the nearest bus stop to Koigi bog is 5 km away, for which people would rather not walk and need a car to take a bike or move to the bog. The nearest catering and accommodation establishments are 3.3 and 6.6 km away, but it is also possible to take a meal with you on the tracks, as there are enough benches on both tracks. Access to the trails is on the Riisa bog from the highway and on the Koigi bog from the village road. Both bogs have about 5 km of trails and observation towers. Koigi bog also has a viewing platform and 3 bridges. In terms of infrastructure, the parking capacity in the Koigi bog is better, as it can accommodate 20 cars, but in the Riisa bog, most cars park next to the highway, because the parking area is only for 10 cars. Both bogs have enough and very informative information boards. There are also 4 decent toilets in Riisa bog, 2 of which are for wheelchair users. There are several resting areas and benches along the path.

Table 12. East-Estonia bogs hiking trails

	Location		
Attribute	Selisoo		
Distance from the center	Nearest city: Narva 75 km, Tallinn 173 km		

Nearest bus and rain stop	Bus: 12 km		
Nearest food and accommodation	Iisaku 12 km		
Accessibility	Rather complicated, roadway, sign available		
Attractions	4 km nature trail, camping site, campfire site		
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Parking for 6 cars, 2 information boards. toilet		

From the bogs of Eastern Estonia is pointed out Selisoo bog, which is located 75 km from the nearest larger city. The nearest bus station is also 12 km away, which requires a car to reach the bog. Also, the nearest places to eat and stay are 12 km away in Isaaku, which is too far to walk. Access is rather more complicated, with many different turning points and signs. The bog is characterized by a 4 km long trail, a camping site and a campfire site. In terms of infrastructure, there is a medium-sized parking space for 6 cars and one toilet and information board.

3.1.4 Active recretional areas (sports parks, adventure parks)

Table 13. North-Estonia active recreational areas

	Location		
Attribute	Rummu quarry	LaitseRallyPark	Kõrvemaa Hiking and Skiing Centre
Distance from the center	Closest city: Tallinn 44 km	Closest city: Tallinn 39 km	Nearest city: Tallinn 58 km
Nearest bus and rain stop	Bus: 550 m	Bus: 300 m	Bus: 230 m
Nearest food and accommodation	Paekalda Holiday Centre 5,6 km	LaitseRallyPark hoilday houses next to Park	In complex of Kõrvemaa Hiking and Skiing Centre
Accessibility	Not accessible by wheelchair, highway, signs available	Accessible by wheelchair, highway, signs available	Highway, signs available, not accessible by wheelchair
Attractions	Quarry, prison buildings, diving and snorkeling, fatbike tour, lighted raft tour, flyboard ride	600 m go-kart track, kids playground and traffic town, picnic area	Hiking, discgolf, orienteeering, archery and equipment renal, camping area, playground for kids, fatbikes, roller skates

			and roller skis, winter equipment rental
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Big parking lot in gate, information boards, toilet	Parking, information boards, toilets, picnic area	Parking for cars and for caravans, information boards, toilets, picnic area, camping site

Rummu quarry, Laitse RallyPark and Kõrvemaa hiking and skiing center have been selected from the recreational areas of active use in Northern Estonia. The distances of all active sports venues from the largest cities are in the range of 39-58 km. The nearest bus stations in all three areas are within a few hundred meters, which means that you can get to all of them on foot. The nearest catering and accommodation places are located in the complex of the center, on the example of Laitse RallyPark and Kõrvemaa hiking center. Access to all is from the highway, there are enough signs to guide the road, LaitseRallyPark is best accessible by wheelchair. All 3 recreation areas have completely different uses. In Rummu quarry you can do water sports, in Rally Park you can drive cars and go-karts, and in Kõrvemaa hiking center you can go hiking, orienteering and winter sports. In addition, there is a picnic area and a playground for children in Laitse RallyPark and Kõrvemaa Hiking Center. Kõrvemaa hiking center is also best equipped with infrastructure elements, there is a large parking lot that can accommodate cars, buses and caravans. Toilet and information boards are available at all three active sports centers.

Table 14. South-Estonia active recreational areas

	Location		
Attribute	Otepää Winterplace	Kuutsemäe Ski Resort	Väike-Munamägi Ski Resort
Distance from the center	Nearest city: Tartu 43 km	Nearest city: Valga 36 km, Tartu 57 km	Nearest city: Otepää 2,5 km, Tartu 46 km
Nearest bus and rain stop	Bus: 190 m	800 m	120 m
Nearest food and accommodation	In city of Otepää	Next to Kuutsemäe Holiday Centre	Food: in Väike-Munamägi Ski Resort Accommodation: Otepää city 2,5 km
Accessibility	Not accessible by wheelchair, highway, signs available	Not accessible by wheelchair, highway, signs available	Not accessible by wheelchair, highway, signs available
Attractions	Snowtubing tracks, sledging, skiing slopes, skating rink, igloo cinema, tube and sledge rental	7 skiing slopes with different difficulty, slope for kids, snowboarding and skiing park, mountain	Two skiing hills, longest skiing slope 450 m, lowest 70 m, in summer people can

		skiing and snowboarding rental	rent an e-bike or enjoy nature on lift
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Parking, information boards	Parking, information boards, toilets, site lighting, holiday houses	Parking, information boards, toilets site lighting

In Southern Estonia, the areas intended for active active recreation are related to winter sports. Therefore, Otepää Winterplace, Kuutsemäe Ski Center and Väike-Munamäe Ski Center were chosen as recreational areas for active sports in this area. All areas are located near the winter city of Otepää and the distances of one of the largest cities in Estonia, Tartu, vary between 43-57 km. This means that these areas are mostly visited by the people of Tartu the most, but they are also popular among other Estonian cities. All the areas are well accessible, all places are connected by a good highway and several signs lead to all places. Unfortunately, wheelchair access is not available in any of these areas. Otepää Winterplace, Kuutsemäe Ski Center as well as Väike-Munamäe's most exciting attractions are several ski and toboggan hills and rental equipment for the necessary equipment. All three of the infrastructure have large parking lots and information boards.

Table 15. West-Estonia active recreational areas

	Location		
Attribute	Valgeranna Adventure Park	Audru racing circuit	
Distance from the center	Nearest city: Pärnu 8,6 km, Tallinn 132 km	Nearest city: Pärnu 3,6 km, Tallinn 130 km	
Nearest bus and rain stop	Bus: 2 km	Bus: 850 m	
Nearest food and accommodation	Doberani beach house 750 m	Audru city 11 km Pärnu city 3,6 km	
Accessibility	Highway, signs available	Accessible by wheelchair, highway, signs available	
Attractions	6 adventure trail, children's adventure trail, bridges, swings, sliding down ropes, beach view	4 tracks racing circuit, longest 3,2 km, rally cross track and an off-road track	
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Parking, information boards, toilet, picnic area, sandy beach	Parking, information boards, toilets	

Valgeranna Adventure Park and Audru circuit were chosen as the areas of active recreation in Western Estonia. Both are located near one of the largest cities in the region, Pärnu. The nearest

bus stops are 850 meters away and 2 km away, which means they are well within walking distance. The nearest restaurants and accommodation are within a few km, which means that they can be reached on foot or by public transport. Accessibility is from both sides along the highway, but wheelchair access is only from the Audru racing circuit. Valgeranna Adventure Park has several adventure tracks and also for children, Audru Racing Track has a multi-track circuit. Both recreation areas have a parking space of sufficient capacity to accommodate visiting cars and toilet facilities.

Table 16. East-Estonia active recreational areas

	Location		
Attribute	Kiviõli Adventure Center	Aidu quarry	Alutaguse Adventure Park
Distance from the center	Nearest city: Rakvere 38 km, Tallinn 133 km	Nearest city: Rakvere 51 km, Tallinn 146 km	Nearest city: Sillamäe 31 km, Tallinn 179 km
Nearest bus and rain stop	Bus: 1,5 km	Bus: 2 km	Bus: 1,4 km
Nearest food and accommodation	Tuhamäe Hostel 350 m	Tuhamäe Hostel 13 km	Alutaguse Recreation and Sports Center 90 m
Accessibility	Accessible by wheelchair, highway, signs available	Not accessible by wheelchair, rather complicated to find, gravel road and some signs available	Not accessible by wheelchair, highway, signs available
Attractions	2 slopes: 1. ski slope - downhill trails, snowboarding park, snowtubing run 2. slope – Motocross centre, trail length 1950 m, height 26 m	Off-road vehicles, motor boats, canoes, rafts, dragon boats, water skis, ATV tour, Extreme safari, Off-road safari, Enduro safari, boat sauna	5 adventure track, Children's Adventure Park, 22 obstacles, tubing track, cable ride above a lake 220 m and 400 m long
Facilities (parking, information, toilet facilities, picknicking, changing rooms etc.)	Big parking lot, information boards, toilets, accessible for wheelchair, picnic area, changing rooms	Parking rather discretionarily, information boards, toilet, camping	Parking, information boards

Kiviõli Adventure Park, Aidu Quarry and Alutaguse Adventure Park are highlighted as active recreation areas in Eastern Estonia. All three sites are 31-51 km from the larger settlements nearby. Also, the nearest bus stops are within a few km, which is also suitable for walking. Of the food establishments and accommodation places, the closest places are Kiviõli Adventure Park and Alutaguse Adventure Park, which are very close to these recreation places. Access is more convenient at Kiviõli and Alutaguse Adventure Park, because there is a good road leading to them, and there are also several signs for guidance. Access to Aidu's quarry is a bit difficult

because the gravel road leads there and is not well indicated. Wheelchair access is only possible at Kiviõli Adventure Park. The infrastructure is better built also in Kiviõli, there is a large car park, information boards, toilets, picnic area. In Aidu's quarry, parking was not so well defined and people rather parked discretionarily.

3.2. Problems and damages

This chapter presents the data collected during the surveys of recreational sites (March 2020 - February 2021), which highlights their more general problems and the main damages of such sites. The following describes 4 different problematic and damaged topics.

3.2.1. Overcrowding

The biggest problem that was noticed in such recreation areas is definitely overcrowding and the situation when the capacity of the area is smaller than the number of visitors at the moment. The observational analysis was mostly carried out in the most well-known and popular recreation areas of Estonia, which also explains the fact that there are more visitors there due to their popularity. Due to the fact that the survey took place between March 2020 and February 2021, it was certainly also affected by the isolation requirement due to the coronavirus (COVID-19), which took people out into the forest and nature very much. Such overcrowding and visitor load also has a rather negative effect on the infrastructure of such recreation areas, such as hiking trails and overcrowding of campfire and camping sites, which also requires people to look for accommodation nearby.

3.2.2. Disturbance of nature

The large number of visitors also has a negative effect on the nature there. In these places, there may be trampling of vegetation and soil, as well as dumping of waste, which in turn may damage the vegetation, as well as end up in water bodies in these recreational areas and disturb the biota. During the observation, it became clear that trampling was most noticeable on different hiking trails, where people had to step off the trail to pass each other in order to pass the oncoming people. Which also leads to the fact that the trails were too narrow on some hiking trails.

3.2.3. Garbage

The next problem is the pollution of recreational areas. Based on the information collected during the survey, it can be said that there were at least 1 trash bin in almost all the places

visited. The problematic part is that there was a lot of garbage around the bins, because the bins were often full. This may indicate that the waste management was not good enough or that there was too little trash bins for the capacity of the area. It was also noticeable abandoned garbage in the campsite areas, where people had not cleaned their trash from campfire sites and nearby areas.

3.2.4. Walking trail surface and access

The fourth problem can be highlighted the access to the hiking trails and the surface of the walking trails. Many hiking trails do not have wheelchair or baby pram access because the trail is either too narrow or there are no barriers next to the trail. It was also noticed on several hiking trails that the road surface was not good enough, especially in winter. The trail was either too slippery or covered in ice, so people often slipped on the vegetation next to the trail. Among the types of hiking trails, you can mainly see a boardwalk, a slippery boardwalk with a metal net, a forest road, and a paved road.

Figure 3. Different walking trail surfaces examples (Riisa – with a metal net against slipping, Meenikunno – without a metal net and slippery, Vääna-Jõesuu – a forest road). Author's photos.

3.4. RMK interviews

This chapter presents various questions asked from RMK specialists, which were summarized and answered by Planning Monitoring Specialist Kerli Karoles-Viia and sent by e-mail on 09.04.2021.

Question 1 - What are the most commonly used areas? Why these?
Answer – „Speaking of 2020, the areas with the highest number of visitors can be found from RMK website subchapter - News 2021, it is possible to make assumptions about the reasons, finding out the specific reasons would probably require a separate study."

According to the information of the counters installed in the state forest, the most visited recreation areas last year were the recreation area around Tallinn (incl. Keila-Joa park, 355 500 visits in total), the recreation area on the northern shore of Lake Peipsi (incl. Oru park, 307 500 visits) and Nõva recreation area (261 200 visits). The most popular protected areas were Lahemaa National Park (169 100 visits) and Soomaa National Park (96 100) and Matsalu National Park (52 000) (RMK metsapuhkuse võimalusi kasutati mullu rekordilised 2,9 miljonit korda | RMK, 2021).

- Survey of visits to recreation and protection areas managed by RMK

Also there is survey of visits to recreation an protection areas managed by RMK and the aim of the survey was to map the awareness and visitability of RMK recreation areas among the Estonian population, including assessments of the need for nature recreation and movement opportunities in state forest areas. The use of recreation and exercise opportunities created by RMK has increased: while in 2012 36% of the population had visited a RMK recreation area or national park in 12 months, in November 2020 64% of respondents stated that they have been in RMK recreation or protection areas or national parks for 12 months visited. Among RMK national parks, Lahemaa National Park has been visited the most (17% of the population), recreation area around Tallinn (17%) and Otepää protected area (7%). 18% of the residents have visited some RMK hiking trails in the last 12 months, and the attendance of different hiking trails is generally equal: 9% have visited the Oandu-Aegviidu-Ikla hiking trail,

7% of the Peraküla-Aegviidu-Ähijärve hiking trail and 7% of the Penijõe-Aegviidu-Kauksi hiking trail (RMK majandatavate puhke- ja kaitsealade külastatavuse uuring, 2020).
- The material is from p. 5 Results of the 2015 visitor survey, which also discuss motives, etc (Külastajaseire RMK-s, 2018).
- The basic visitor survey reports can be found on the pages of the visit management plan materials (Külastuskorralduskavad | RMK, 2021)

Question 2 - What affects the use of these areas the most?
Answer – „Coincides with the answer to the previous point."

Question 3 - How do these areas affect areas close by - water/forests/nature reserves?
Answer – "Movement in the wild can inevitably have effects on the natural environment, from disturbance of birds and animals to trampling of the underlying vegetation and damage to tree roots. The impact depends to a large extent on many factors - the way of use, natural preconditions and the preparation of the site for receiving visitors. The effects can be very different and it is very difficult to summarize briefly. We recommend that you take a look at various studies on the subject."

Question 4 - Do you have data on how created recreation areas have had a positive or negative impact on the environment?
Answer – „Planning, effects of the visit and measures to prevent negative effects"
Movement in the wild can inevitably have effects on the natural environment, from disturbance of birds and animals to trampling of undergrowth and damage to tree roots. The impact depends to a large extent on many factors - the way it is used, the natural conditions and the preparation of the area for receiving visitors. The condition of tread-sensitive and long-recovery communities is also more affected by weather conditions, such as warm and low-rainfall summers, when the visitor load is generally higher. In order to obtain planning input information, RMK has carried out or commissioned monitoring and surveys: a survey on determining the recreational load tolerance of forests and planning protection measures, monitoring the condition of nature conservation sites, monitoring the volume of visitors and the amount of waste and firewood consumed. Results of the study and monitoring based on nature, the biggest impact on the condition of nature conservation landscapes is disregard of prohibition signs and boundaries and off-road traffic (Külastuskorraldus RMK-s, 2021).

Question 5 - What do you do to prevent disturbance of wildlife and trampling of flora?
Answer – „The prevention and reduction of the negative effects of the visit have taken place through several lines of action. Only one part is the construction of infrastructure (directing visitors to the sites prepared for this purpose, including, for example, the construction of borders and the implementation of landscape protection measures), while attitudes and information sharing are no less important. remedial events, etc.).“

„Of the implemented landscape protection measures, good results have been given, for example, by the temporary closure of a tread-sensitive nature conservation site and the subsequent change of the site plan, the prohibition of major events, the restriction of the use of nature conservation objects and construction of landscape-oriented visitor infrastructure - parking pockets, railings etc.“
- Planning, effects of the visit and measures to prevent negative effects (Külastuskorraldus RMK-s, 2021).
- Instructions for nature walkers (Kuidas looduses käituda? | Loodusega koos | RMK, 2021).“

Question 6 - What do you do about soil erosion and water pollution?
Answer – „Planning, effects of the visit and measures to prevent negative effects. In addition to infrastructure planning, information also plays an important role, both through the website Loodusega Koos, „RMK Loodusega koos“ the smart application, as well as through information boards located in nature.“
- Instructions for nature walkers (Kuidas looduses käituda? | Loodusega koos | RMK, 2021)

In 2008, RMK's visitor management department started monitoring the condition of nature conservation objects. Monitoring is based on the condition class assessment methodology, including both the landscape and infrastructure characteristics of the site - the condition of the soil and undergrowth and the infrastructure. In order to ensure the best possible condition of nature conservation objects and to prevent the deterioration of the condition, landscape protection recommendations are prepared for the monitoring objects in the course of monitoring and based on the data.“ (Külastuskorraldus RMK-s, 2021).

Question 7 - How do you maintain and preserve different views, reduce noise?
Answer – „Opening of views and similar works are carried out by RMK's nature conservation department.“

Question 8 - How do you deal with overcrowding?

Answer – „There are many solutions, some sites can update the infrastructure plan (better targeting visitors, zoning usage patterns, etc.), some areas can scatter visits to other nearby sites, as well as continuous information and referral (especially in 2020, where information was shared on the website, for example for lesser known objects) etc.“

Question 9 - What threats may arise to different protected or historical elements and how do you protect them?

Answer – „When designing infrastructure, design conditions are requested from the local government. Infrastructure planning in protected areas is carried out in coordination with the manager of the protected area, the Environmental Board.“

Question 10 - How do you ensure that all recreation areas have the necessary facilities? Eg trash bins, toilets, facilities for people with disabilities?

Answer – „The nature of the infrastructure depends on the specifics of the object of visit, the requirements of completeness and condition are followed. Due to the specifics of the objects, it is not possible to ensure access for visitors with different needs everywhere (there may be a relief landscape, there may be restrictions due to the location in the protected area, etc.) When planning, possibilities are analyzed and, if possible, the needs of visitors with different needs are taken into account when designing the infrastructure, where the principles of universal design can be applied. Using the www.loodusegakoos.ee search, it is possible to find visitor objects with a disability access. The existence of rubbish bins on all objects is not the goal, but rather to promote a conscious visit to nature. We recommend reading the "Garbage free in nature" page on the website. A conscious user of forest benefits does not leave anything in nature that does not belong there. Garbage transport from remote and inaccessible places is an expensive, non-renewable raw material and often very complex activity. In order to reduce the ecological footprint of waste management in nature, we strive for the goal that each nature visitor takes the garbage to the appropriate waste management point. RMK has created an opportunity to dispose of rubbish in several places in nature, but we want them to be used primarily by so-called backpackers. For those arriving by car, we have a great request to take our brought rubbish out of nature.“

Question 11 - Do you have toilets, benches, trash bins, facilities for people with disabilites on all hiking trails and recreation areas? Have you collected data on how much and how much more is needed? If not, do you plan to add in the near future?

Answer – „Renewal and development of visitor infrastructure is an ongoing process, including the construction of new elements as well as the renewal of depreciated infrastructure. The nature of the infrastructure depends on the specifics of the object of visit, the requirements of completeness and condition are followed. Regarding the nature of the infrastructure, for example, there is information about the object of the visit on the information leaflets (Parking, equipment, etc.)“

Question 12 - Has there been any feedback from visitors that some facilities are missing somewhere, such as benches, picnic tables, parking spaces, access, toilets, facilities for the disabled?

Answer – „An important input in planning the development of areas is visitor surveys. Visitor surveys create a picture of what the user groups of different areas are, what the expectations, needs, etc. of the visitors are in order to make planning decisions based on the received input. Visitors can also use different information channels to transmit current information via different information channels.“

Question 13 - How and how much were different areas and use of them affected by spring 2020 corona time?

Answer – „Relevant reports on the topic are currently being prepared and will be published on the materials page of the visit management plans in the near future.“

3.4. People's questionnaire answers

Another research methodology was an online questionnaire for people. The questionnaire was available in the last weeks of February and the first weeks of March. A total of 55 people from different age groups and people from different residences and places all over Estonia responded. The topic of the questionnaire was to survey and analyze people's recreational habits in Estonia. The questionnaire contained a total of 16 questions, of which 12 were multiple choice and 4 were free-form.

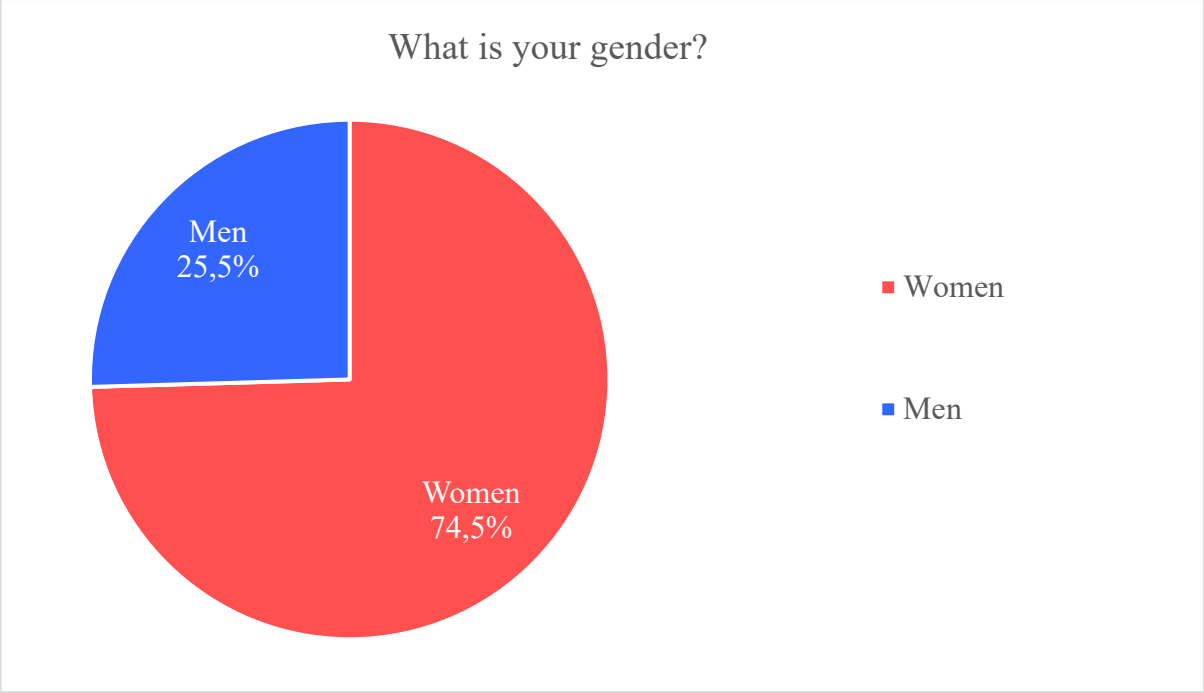

Figure 4. Question 1 – What is your gender?

The majority of respondents were women, ie 74.5% and 25.5% men. This means that 41 of the 55 respondents were women and 14 were men.

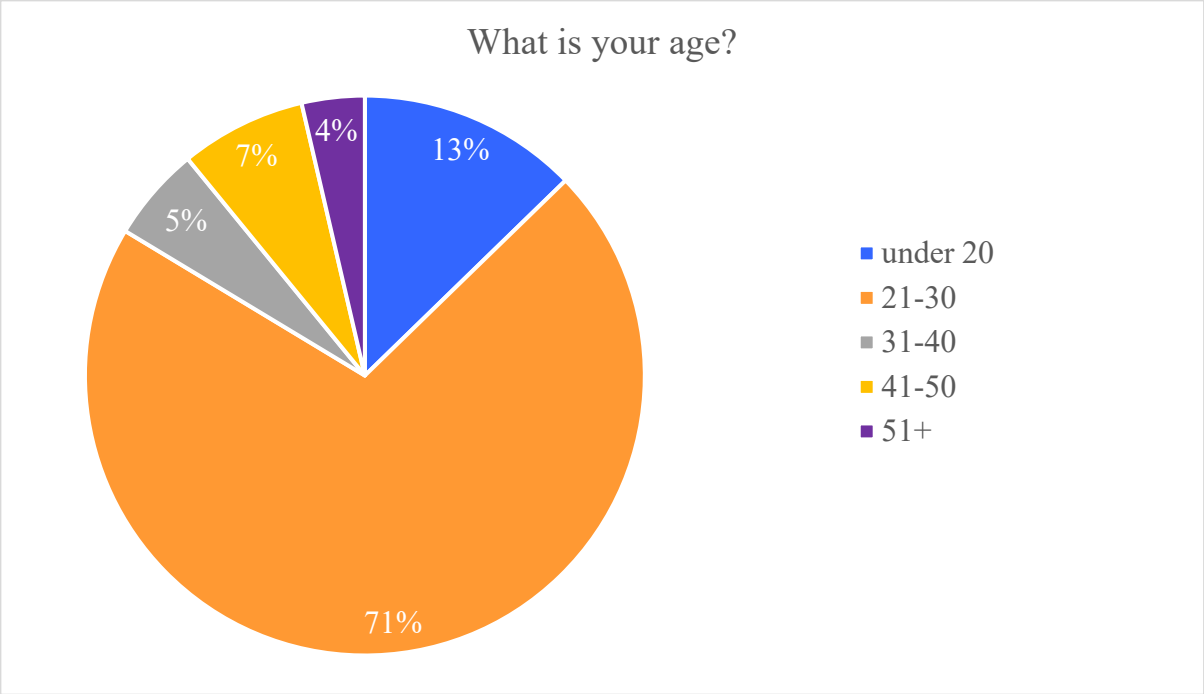

Figure 5. Question 2 – What is your age?

The age groups were distributed differently. The largest number of respondents was aged 21-30, they accounted for 71% or 39 out of 55 people. The next age group was under 20 years old, they accounted for 13% or 7 people. The third age group was 41-50 years old, they accounted for 7% or 4 people. The fourth age group was 31- 40 years old, they accounted for 5% or 3 people. The last age group was over 51 years old, they accounted for 4% or 2 people.

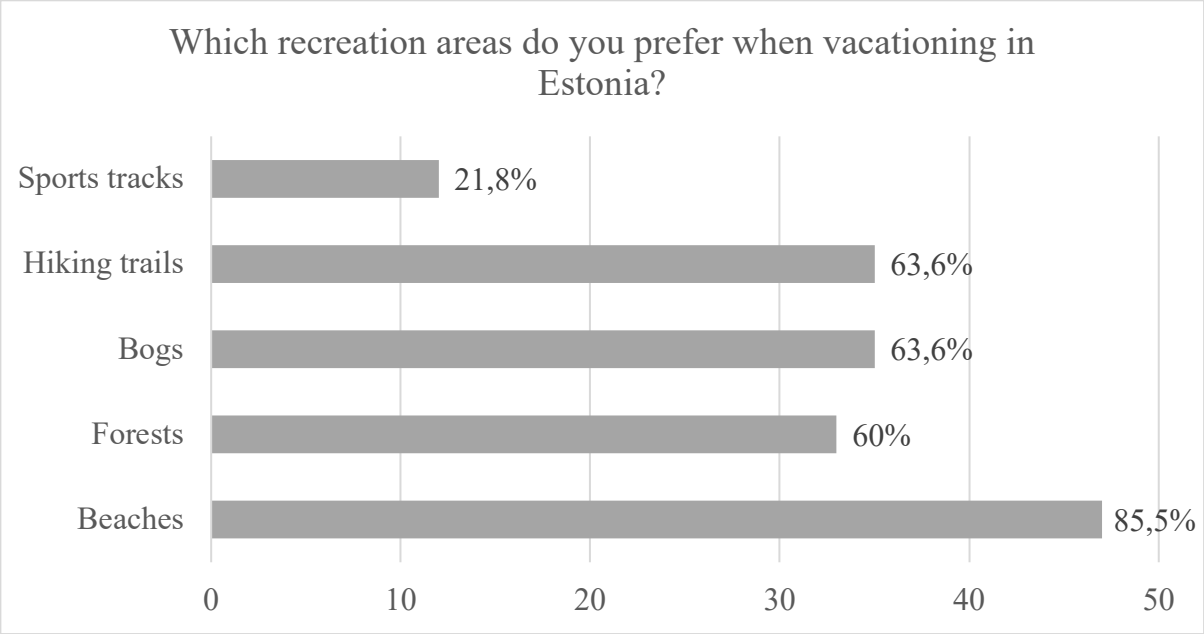

Figure 6. Question 3 – Which recreation areas do you prefer when vacationing in Estonia?

The third question examined people's preferences for recreational areas in Estonia. The data showed that people like to relax on beaches and water bodies the most, it accounted for 85.5% or 47 people. Next in terms of popularity, ie people like to go on hiking trails as well as bogs, both accounted for 63.6% or 35 people of the respondents. The third option was forests and forest trails, which accounted for 60% or 33 people. The last were sports tracks and sports facilities, which accounted for 21.8% or 12 people.

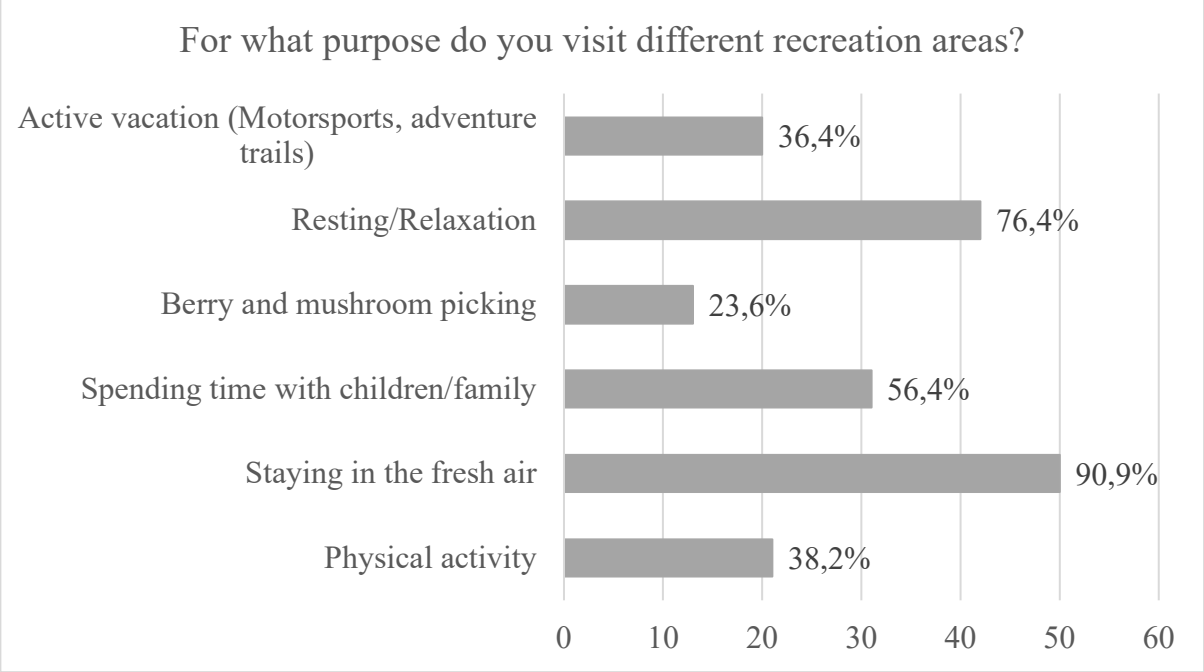

Figure 7. Question 4 - For what purpose do you visit different recreation areas?

The fourth question examined why people like to visit different recreational areas. There were 6 different options to choose from and most people considered it necessary to stay in the fresh air, which accounted for 90.9% or 50 people. For next reason, people considered it necessary to just rest and relax outside, it accounted for 76.4% or 42 people. Spending time with children and family was also important for more than half of the respondents, it accounted for 56.4% or 31 people. 38.2% of all respondents like to be physically active, ie 21 people also like to do sports while staying outdoors. There were also 36.4% of enthusiasts of various active sports, ie 20 people who like to visit various active sports facilities, such as various motorsport services and adventure parks. The lowest number of respondents were berry pickers and mushroom pickers, they accounted for only 23.6% or 13 people.

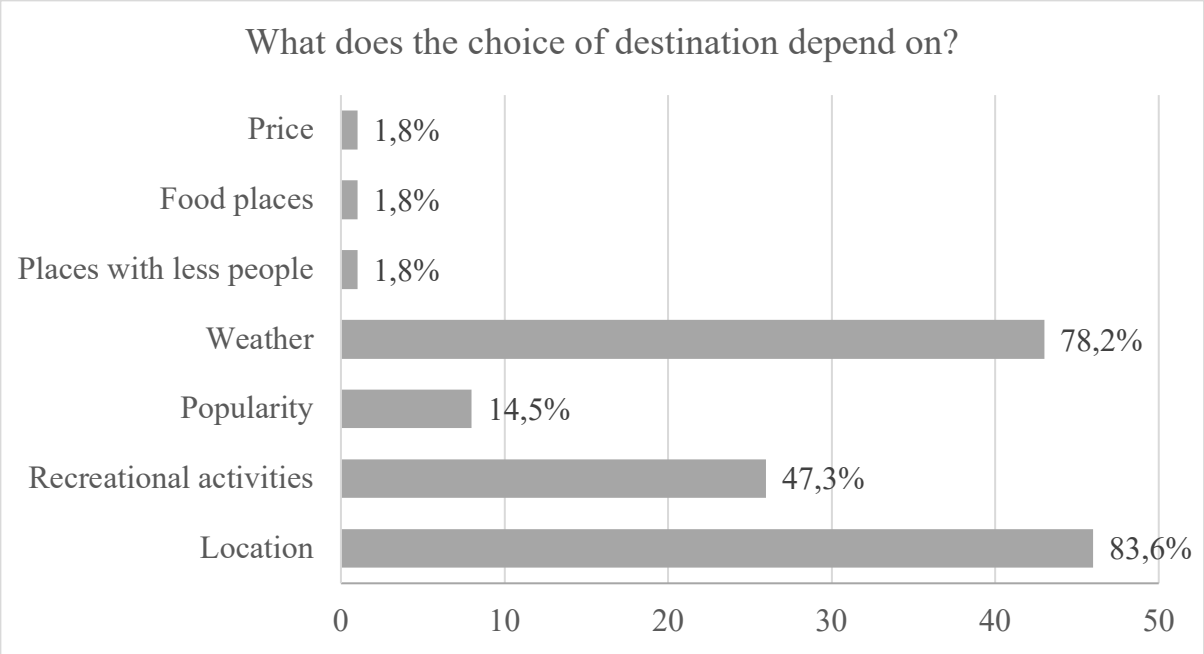

Figure 8. Question 5 - What does the choice of destination depend on?

The fifth question asked people on what does the choice of destination depends. The most important thing for people was to choose a destination by location and weather. Location was important among 83.6% of people, or 46 people. The effects of the weather were almost as important, accounting for 78.2% or 43 people. Slightly less than half were affected by the existence of recreational activities offered at the destination, which is 47.3% or 26 people. Surprisingly, the popularity of the destination was also less important, which is reflected, for example, on the Internet or social media, it accounted for 14.5% or 8 people. The price effect and the presence of food providers formed equally, being 1.8% of the respondents or 1 person. 1 person also wrote as an option that they prefer to go to places with fewer people.

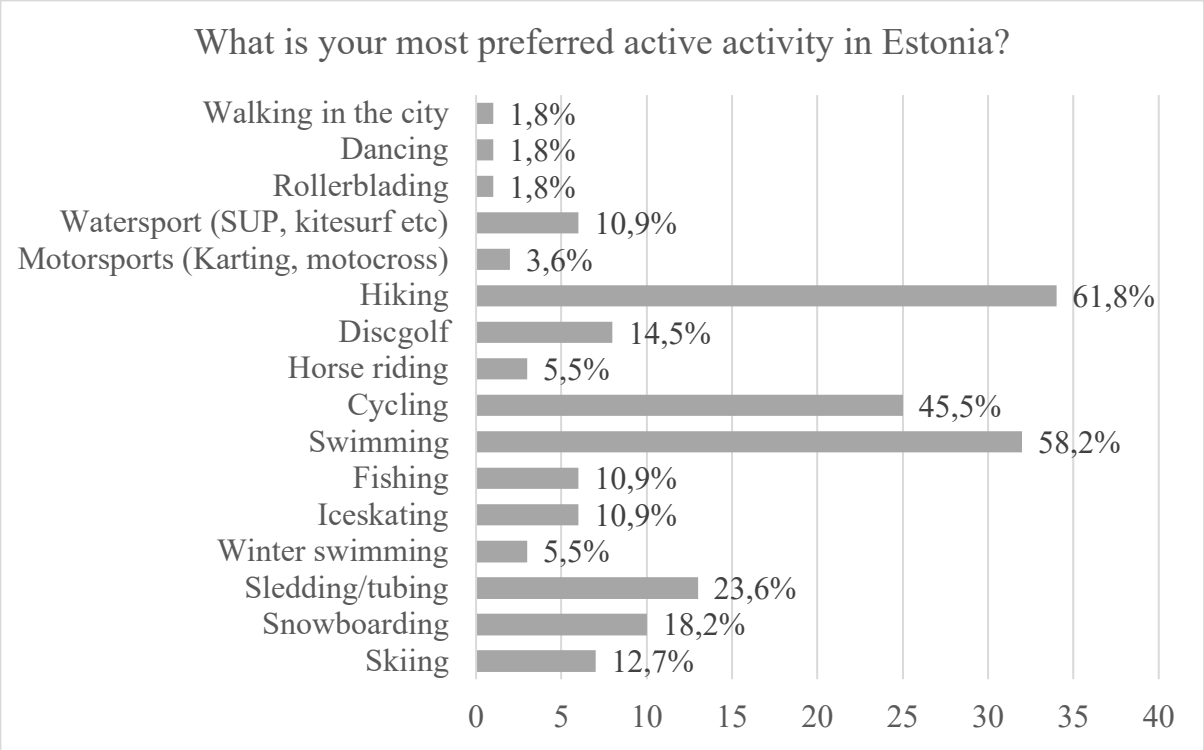

Figure 9. Question 6 - What is your most preferred active activity in Estonia?

The sixth question examined people's athletic and active preferences when choosing a recreation area. The result showed that the most popular were hiking, swimming and cycling. Hiking accounted for 61.8% or 34 people, swimming for 58.2% or 32 people and cycling for 45.5% or 25 people. Also, a lot of answers were chosen for winter, such as sledding, snowboarding and skiing. Which accounted for 23.6% or 13 people sledding, 18.2% or 10 people snowboarding and 12.7% or 7 people skiing. Also, a large part was formed and at the moment a very popular area is playing discgolf, which is 14.5% of the respondents or 8 people. Also water sports activities such as SUP boarding and surfing, which accounted for 10.9% or 6 people, and motorsports such as ATV, karting and motocross, which accounted for 3.6% or 2 people. The choices that people added to the questionnaire were dancing, rollerblading and walking in the city.

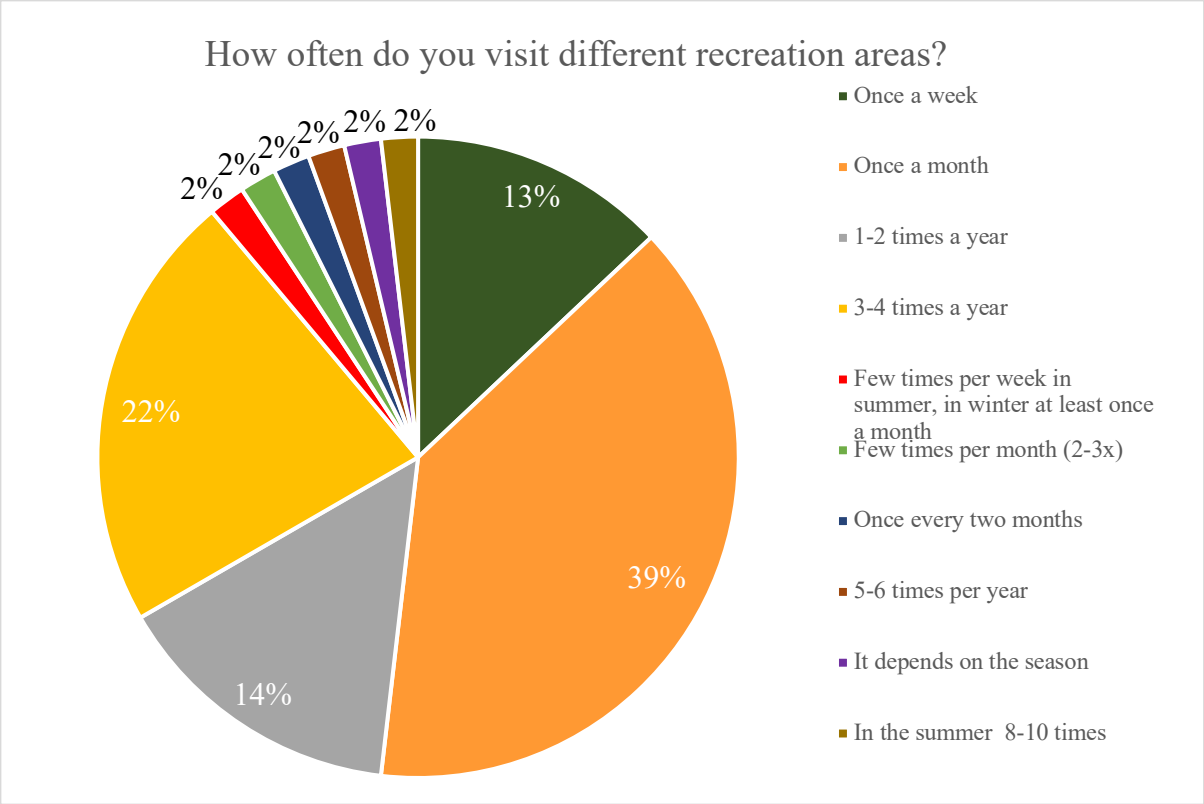

Figure 10. Question 7 - How often do you visit different recreation areas?

The seventh question examined how often people visit different recreational areas. It turned out that the most visits are made once a month, which was chosen by 39% or 21 people. The second choice was 3-4 times a month, which was chosen by 22% of people, ie 12 people. The third and fourth choices were almost the same percentage, which means that 13% or 7 people voted once a week and 14% voted 1-2 times a year. The same percentage were several times a week in summer and winter at least once a month, 2-3 times a month, once every two months, 5-6 times a year and in summer 8-10 times. It was also said that it depends on the season.

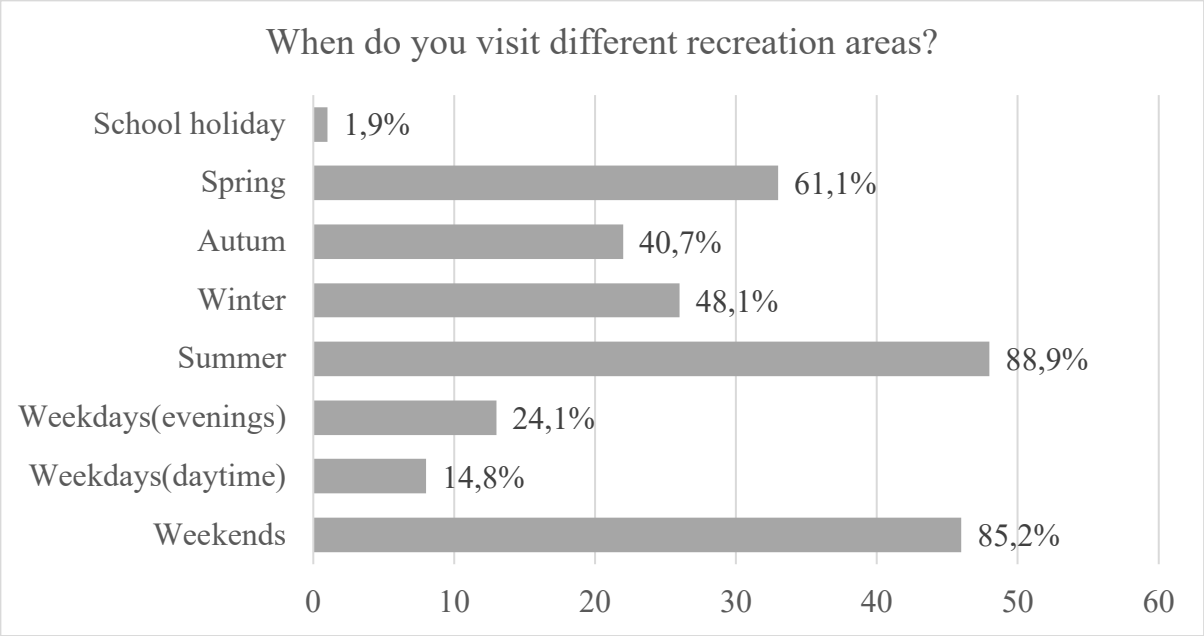

Figure 11. Question 8 **-** When do you visit different recreation areas?

The eighth question is a bit related to the previous question, how often and when people like to visit recreation areas. The largest share of seasons is summer, which makes up 88.9% or 48 people. There is also a lot of nature in the spring. In terms of the week, most people go to nature on weekends, which accounted for 85.2%, or 46 people, and people prefer or are able to go to nature in the evening rather than during the day.

Figure 12. Question 9 - How much time do you plan for visit?

The ninth question asked people how long they plan or how long they spend in different recreational areas. The results showed that the most time is planned for a few hours, which accounted for 64.8% or 35 people. People also plan to visit for the whole day, which is 48.1% or 26 people. Equally are cases over the whole weekend or, for example, several days in a week.

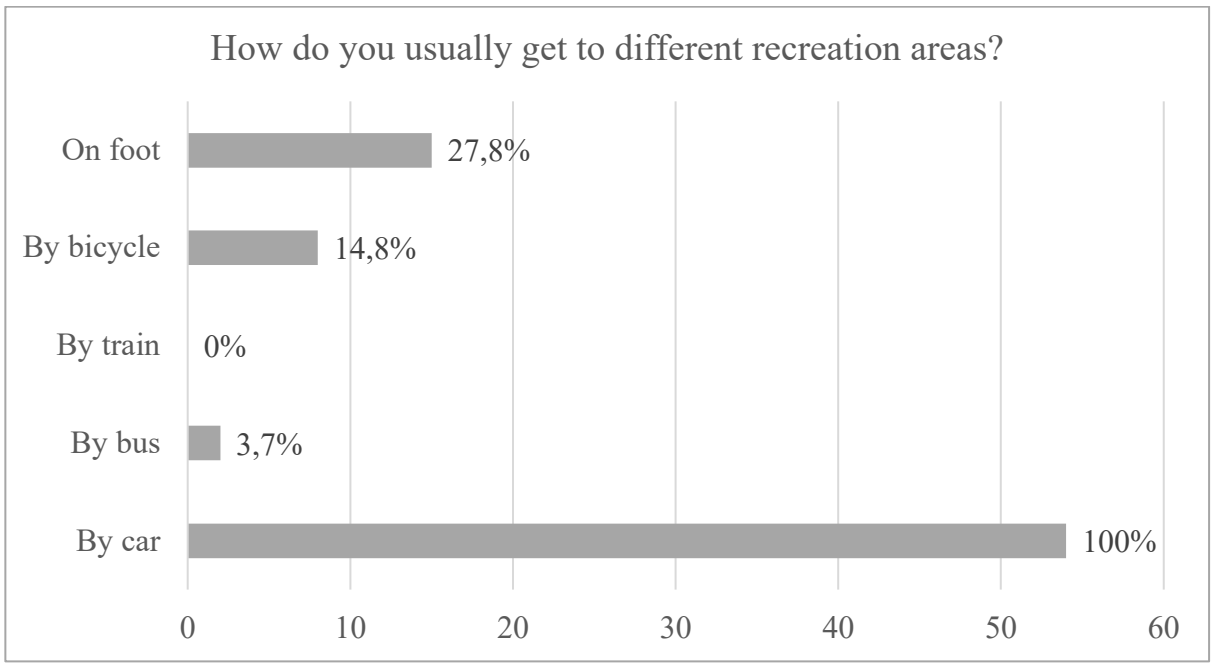

Figure 13. Question 10 - How do you usually get to different recreation areas?

The tenth question examined how people move or what transport they use to reach their destination. The biggest and 100% result was obtained by driving, ie it was chosen by all respondents. There is also a lot of walking on foot, or 15 people, or cycling, or 8 people. Surprisingly, the least respondents to this survey use public transport such as a bus or train.

Question 11 - What is the most pleasant beach/swimming place in Estonia? Why this?

Mentioned beaches were Ristna, Võsu, Männiku, Meremõisa, Kabli, Kauksi, Pärnu, Paala, Kunda, Lähte, Seljametsa, Valgeranna, Võrtsjärv, Liivalauka, Meenikunno, Luhasoo, Lemmerand, Matsi rand, Narva-Jõesuu, Karepa, Porkuni, Kakumäe, Kaberneeme, Rutja, Vainupea, Käsmu, Kalvi, Kalijärv, Valkla, Kuningjärv, Nõva rand, Palojärv and Saadjärv.
The beaches of Pärnu, Kauksi and Võsu were mentioned the most. Pärnu was mentioned 7 times, the reason was a beach with beautiful sand, all amenities nearby, clear and warm water.

Kauksi was mentioned 10 times, the reason was a beach with beautiful soft sand, warm water, a lot of space, a lot of accommodation and camping areas nearby, childhood memories. Võsu beach was mentioned 5 times, the reason was because the beachhas big sand aea, close to home and all the entertainment that takes place there.

Question 12 - What is the most pleasant hiking trail in Estonia? Why this?

The hiking trails of Taevaskoja, Selli-Sillaotsa and Valgesoo were mentioned the most. Taevaskoja hiking trail was mentioned 7 times and the grounds were beautiful, different landscape, you can walk along the river, beautiful nature, the trail is not too long or short, beautiful and magical place. Selli-Sillaotsa has long enough roads, beautifully arranged roads, beautiful nature and a good distance from the residence, diverse nature, few people, alternating landscape. Valgesoo hiking trail is the most convenient for hiking with a child, short, diverse nature and few people.

Question 13 - What is the most pleasant bog in Estonia? Why this?

Of the bogs, Kakerdaja, Meenikunno and Viru bogs were mentioned the most. Kakerdaja bog was mentioned 5 times, the reasons were close to home, sentimental meaning, beautiful, beautiful view, good boardwalk, good length of trail. Meenikunno bog was mentioned 7 times, due to the good location, spacious landscape and beautiful lakes, you can swim, a campfire site, beautiful nature, long enough and exciting. Viru bog was mentioned 10 times, the grounds were very beautiful and comfortable to navigate, large and spacious, good location, close, familiar, with beautiful views and well maintained, beautiful nature and peculiar.

Question 14 - What is the most pleasant place for an active holiday in Estonia? Why this?

Among the recreational areas of active use, Kuutsemägi, Otepää Adventure Park, Valgehobuse Hill, Tuhamägi, Veskisilla, Vooremäe Disc Golf Park and various disc golf courses, Kiviõli Adventure Park, Laitse Rally Park and Lontova Adventure Park were highlighted. The reasons were different and according to the activities offered, mostly liked that the places can be used both in summer and winter, beautiful scenery and well thought out.

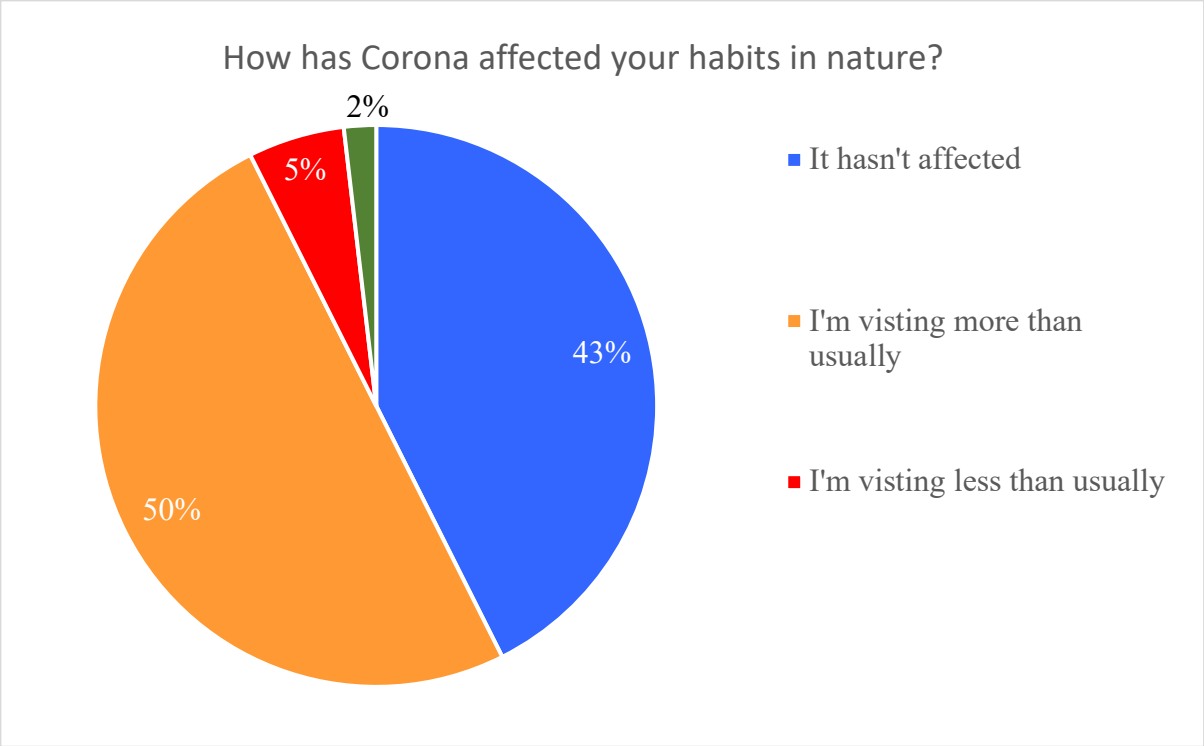

Figure 14. Question 15 - How has COVID-19 pandemic affected your habits in nature?

The fifteenth question examined how much COVID-19 has influenced people's recreational habits in nature. The results showed that half of the respondents, ie 27 people, go to nature and visit recreation areas more than usual. 43% or 23 people answered that they have not been affected and go to nature as much as usual. However, 5% or 3 people answered that they go to the nature even less than usual. It was also answered that it rather depends on the weather and the season.

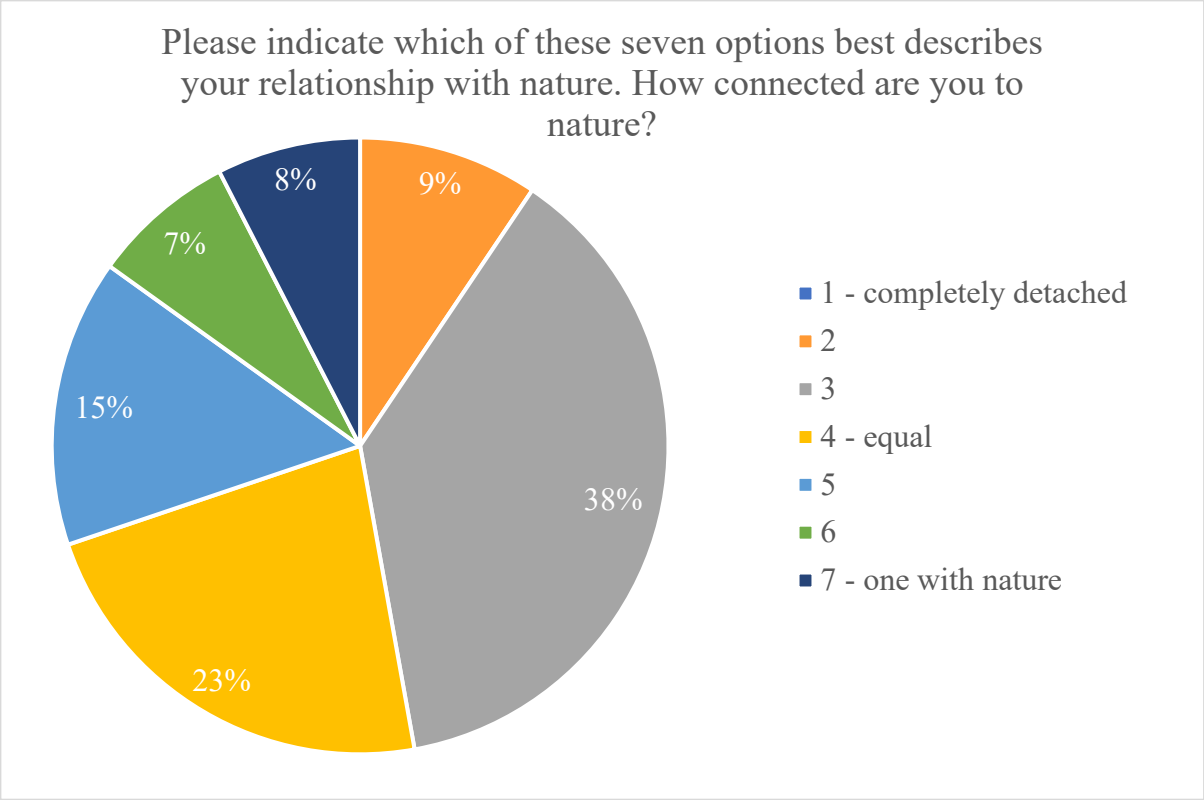

Figure 16. Question 16 - Please indicate which of these seven diagrams best describes your relationship with nature. How connected are you to nature?

The sixteenth question examined which of these seven diagrams best describes people's relationship with nature and how connected people are to nature. The most results came from the number 3 example, ie people chose that they are more separated from nature than equal, that is 38% or 20 people. The second option was chosen by many people to be completely equal to nature, meaning that 23% or 12 people made these choices. Also, 15% or 8 people chose to be more in harmony with nature than completely equal. 9% or 5 people answered that they are rather completely separated from nature, but 8% or 4 people answered that they are completely in harmony with the nature, ie the last variant.

4. DISCUSSION

Based on elaborated scientific literature, observational analysis, RMK interviews and online questions, outdoor recreation is part of the cultural ecosystem service and has a positive effect on people's psychological and emotional stress relief (Haines-Young & Potschin, 2012, p. 344). Outdoor recreation offers a variety of outdoor activities, such as walking, running, picnicking, animal and bird watching, active sports, sunbathing and so on. The online questionnaire revealed that people prefer beaches, which were popular among 85.5% of people, as well as hiking trails and bogs, which were equally popular among 63.6% of people.

The results showed that the use of recreation areas is most affected by the distance from cities, access, the presence of various elements of recreation and facilities (eg hiking trails, parking) (Hare, Barcus et al., 2007; Gesler, Meade et al., 1988; Salonen et al., 2012). The results of the observational analysis revealed that in most cases the nearest larger cities are in the range of 20 - 50 km from these most popular recreation areas. Also, the online questionnaire found that people consider distance from these sites to be important among 83.6% of people. Which also suggests that the existence of public transport is also important for the creation and planning of such areas. Although the online questionnaire revealed that only 3.7% of respondents go to such recreation areas by bus. Most people can go with their own car.

Observtaion of access revealed that not all hiking trails and recreation areas have good enough access for both wheelchairs and baby prams. In most cases, such access on hiking trails is difficult, for example, there is not a sufficiently wide hiking trail or its surface. Also, in the course of observations and on the basis of information collected from the Internet, wheelchair access has not been established in most areas with active recreational use also.

Another important factor influencing the use of recreational areas is the presence of various response facilities and elements and offered activities, which according to the results of the questionnaire was important among 47.3% of people. Such facilities included parking, information boards, toilet facilities, picnicking, changing rooms on the beaches and various location-dependent attractions. Based on observations and information from the Internet,

parking was created for at least 5 cars and up to 30 cars. Parking lots are generally well built and marked on beaches, but in warmer weather there were many visitors, which also meant parking cars by the road. Parking was paid for in Pärnu beach, because it is also visited by the most visitors and according to the questionnaire turned out to be one of the most popular places. Hiking trail parking was also mostly built and marked, although due to heavy use, especially during the spring isolation, cars had also been parked along the roadsides.
There were also at least 1 toilet in almost every recreation area, but most are not suitable for wheelchair users. Information boards were in almost all recreation places, including information in Estonian, Russian and English.

The biggest problems due to the use of recreation areas have been developed in 4 different topics.

The most noticeable was overcrowding, which is also indicated by the survey of RMK visits, which shows that the use of recreation and exercise opportunities created by RMK has increased, if in 2012 36% of the population had visited RMK recreation areas or national parks in 12 months, 64 % of the respondents indicated that they have visited various RMK recreation areas or protected areas during the last 12 months (RMK, 2021). The online questionnaire also showed that 50% of the respondents have visited different recreation areas more than before due to the last year and the COVID-19 period.

The next major problem area is the disturbance of nature highlighted in this work. It has been found that leisure, sports and tourism activities are causing changes in natural ecosystems all over the world (Mcdougall and Wright, 2004; Perevoznikova and Zubareva, 2002; Atik et al., 2009; Whinam et al., 1994). Based on RMK's interviews and information gathered from their website, it also emerged that movement in the wild can inevitably have effects on the natural environment, from disturbance of birds and animals to trampling of undergrowth and damage to tree roots. The impact depends to a large extent on many factors - the way it is used, the natural conditions and the preparation of the area for receiving visitors (RMK, 2021).

Another problem is the lack of proper and adequate waste management, which pointed out that there were too few trash bins in the areas, because there were trash bins in many places, but many had garbage around it. Proper waste management and the creation of bins according to the capacity of the area would contribute to this.

The fourth biggest problem was the access of hiking trails and its surface. Not all areas are wheelchair accessible, mostly the path was not wide enough. For example, the Meenikunno bog trail, where there was a wide and barrier-free boardwalk on both sides of the bog, but the middle part of the hiking trail was very narrow and not wide enough for wheelchairs.

Such problems can be solved by proper planning and estimating the right size of the crowd, as well as by creating opportunities for all visitors to the recreation area.

CONCLUSION

Outdoor and nature-based recreation is a cultural ecosystem service that encompasses all physical and intellectual interactions with biota, ecosystems and terrestrial/marine landscapes. This includes a variety of activities, including walking, jogging or running in the nearby greenery of the city, by the river, lake or sea, cycling in nature, picnicking, and watching the flora and fauna. Daily natural holidays are measured as potential visits that people make to enjoy natural amenities that are suitable for everyday activities, such as working, going to school and shopping. It benefits society by increasing people's well-being (Browler et al., 2010; Korpela et al., 2014).

The aim of the work was to study and analyze the ability of the landscape for recreational opportunities in Estonian outdoor conditions. Investigate their functioning and impact on nature as well as people's preferences when visiting them. In the course of this master's thesis, observations were made in forty one different recreational areas. Various RMK specialists were also interviewed and an online questionnaire was prepared.

The results showed that the use of recreational areas is most influenced by location and distance, access to them and various recreational elements. Another important factor influencing the use of recreation areas, which was used to compare different recreational areas, is the existence of different facilities. Such facilities included parking, information boards, toilets, picnic areas, changing rooms on the beaches and various location-related attractions and sights.

Of the different impacts, four major problems have been identified in this work. These included overcrowding, disturbance of natural areas and plants, waste management and wheelchair access to hiking trails, and various paving materials.

Such problems can be solved by proper planning and estimating the right size of the crowd, as well as creating opportunities for all visitors to the recreation area.

KOKKUVÕTE

Looduspõhine puhkus on kultuuriline ökosüsteemiteenus, mis hõlmab kogu füüsilist ja intellektuaalset vastasmõju elustiku, ökosüsteemide ja maismaa-/ meremaastikega. See hõlmab mitmesuguseid tegevusi, sealhulgas kõndimist, sörkjooksu või jooksmist lähedal asuvas linna haljasalas, jõe, järve või mere ääres, looduses jalgrattaga sõitmist, pikniku pidamist ning ka taimestiku ja loomastiku vaatlemist. Igapäevast looduslikku puhkust mõõdetakse kui potentsiaalseid külastusi, mida inimesed teevad looduslike mugavuste nautimiseks, mis sobivad igapäevaste tegevustega, nt töötamine, kooli minek ja poes ostlemine. See on ühiskonnale kasulik, suurendades inimeste heaolu (Browler jt, 2010; Korpela jt, 2014).

Töö eesmärk oli uurida ja analüüsida maastiku võimekust puhkevõimaluste jaoks Eesti välistingimustes. Uurida nende funktsioneerimist ja mõju loodusele kui ka inimeste eelistusi neid külastades. Antud magistritöö käigus tehti vaatlusi ja anti ülevaade neljakümne ühest erinevast rekreatsioonialast. Intervjueeriti ka erinevaid RMK spetsialiste ja koostati internetiküsimustik.

Tulemustest selgus, et kõige rohkem mõjutab rekratsioonialade kasutamist asukoht ja kaugus, nendele juurdepääs ja erinevad rekreatsioonielemendid. Teine oluline tegur, mis mõjutab puhkealade kasutamist ja mida kasutati erinevate rekreatsioonialade võrdlemisel, on erinevate rajatiste olemasolu. Selliste rajatiste hulka kuulusid parkimine, infotahvlid, tualettruumid, pikinikualad, riietusruumid randades ja erinevad asukohast sõltuvad atraktsioonid ja vaatamisväärsused.

Erinevatest mõjudest on antud töös välja toodud neli suuremat probleemi. Milleks olid ülerahvastatus, looduslike alade ja taimede häirimine, prügikorraldus ja matkaradade ligipääs ratastooliga ja erinevad teekattematerjalid.

Selliseid probleeme saab lahendada korraliku planeerimise ja rahvahulga õige suuruse hindamise, samuti kõigi puhkeala külastajate jaoks võimaluste loomisega.

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APPENDIXES

Appendix 1. RMK interviews

Survey questions for RMK
Johanna Kapper
ENG/EST

RMK/city governments/organizers - RMK/linnavalitsused/organiseerijad:

1. **What are the most commonly used areas? Why these?** / Millised on kõige tihedamalt kasutatavad alad? Miks just need?

2. **What affects the use of these areas the most? /** Mis mõjutab nende alade külastatavust kõige rohkem? Nt asukoht, pakutavad tegevused, hooaeg jne

3. **How do these areas affect areas close by - water / forests / nature reserves?** / Kuidas mõjutavad antud alad neid ümbritsevaid alasid? Nt. veestik/metsad/looduskaitse alad?

4. **Do you have data on how created recreation areas have had a positive or negative impact on the environment? /** Kas teil on andmeid kuidas loodud rajatised (laudteed, lõkkekohad, vaatetornid jne) on ümbritsevat keskkonda positiivselt või negatiivselt mõjutanud?

5. **What do you do to prevent disturbance of wildlife and trampling of flora?** / Mida olete teinud takistamaks elusllooduse häirimist ja taimestiku tallamist?

6. **What do you do about soil erosion and water pollution?** Mida olete teinud mulla erosiooni ja veereostuse tekkimise vastu?

7. **How do you maintain and preserve different views, reduce noise?** Kuidas te tegelete erinevate vaatekohtade hoidmise ja säilitamisega, müra vähendamisega?

8. **How do you deal with overcrowding?** Kuidas te tulete toime ülerahvastusega?

9. **What threats may arise to different protected or historical elements and how do you protect them?** Millised ohud võivad tekkida erinevatele kaitse all olevatele või ajaloolistele elementidele ja kuidas te neid kaitsete?

10. **How do you ensure that all recreation areas have the necessary facilities? Eg trash bins, toilets, facilities for people with disabilities? /** Kuidas te toimite sellisel juhul, et kõikides puhkekohtades oleks olemas vajalikud rajatised? Nt prügikastid/vetsude ja puuetega inimestele mõeldud rajatiste olemasolu?

11. **Do you have toilets, benches, trash bins, facilities for people with disabilites on all hiking trails and recreation areas? Have you collected data on how much and how much more is needed? If not, do you plan to add in the near future? /** Kas teil on kõikides matkaradadel ja puhkealadel olemas nii istumis-, vetsuskäimise ja

prügi äraviskamise võimalused? Kas olete kogunud andmeid kus kui palju on ja palju juurde vaja on? Kui ei, kas plaanite lähiajal lisada?

12. **Has there been any feedback from visitors that some facilities are missing somewhere, such as benches, picnic tables, parking spaces, access, toilets, facilities for the disabled?** / Kas on tulnud külastajatelt tagasisidet, et kuskil on mõnede rajatised puudu, nt pingid, piknikulauad, parkimiskohad, juurdepääs, wc-d, rajatised puuetega inimestele?

13. **How and how much were different areas and use of them affected by Spring coronatime?** Kuidas ja kui palju mõjutas erinevate alade külastatavust kevadine koroonaaeg?

Appendix 2. Questionnaire for people

Questionnaire for people
Johanna Kapper
ENG/EST

1. **What is your gender?** Teie sugu?
2. **What is your age?** Teie vanus?
3. **What is your preference for a holiday in Estonia?** Milline eelistus on teil Eesti puhkamiseks?
   - **beach holiday** /rannapuhkus
   - **hiking trails, bogs** / puhkus matkaradadel/rabas
   - **vacation in the woods** / puhkus metsas
   - **active vacation** / aktiivne puhkus
4. Millise eesmärgiga?
5. **What does the choice of destination depend on?** / Millest sõltub sihtkoha valik?
   - **location (eg close to home)** / asukoht (nt. kodule ligidal)
   - **activities offered** / pakutavad tegevused
   - **purpose (eg beach in summer, skiing in winter)** / eesmärk (nt. suvel randa, talvel suusatama)
   - **popularity, relevance** / populaarsus, päevakohasus
6. Milline on eelistatuim aktiivne tegevus?
7. **How often do you visit different recreation areas per year?** / Kui tihti külastate erinevaid puhkealasid aastas?
   - **1-2 times a year** / 1-2 x aastas
   - **3-4 times a year** / 3-4 x aastas
   - **once a month** / korra kuus
   - **once a week** /korra nädalas
8. **When do you visit different recreation areas?** / Millal külastate erinevaid rekreatsioonialasid?
   - **on the weekend** / nädalavahetusel
   - **during the week (day)** / nädala sees (päeval)
   - **during the week (evening**) / nädala sees (õhtul)
9. **How long do you plan to visit?** / Kui kaua planeerite külastuseks aega?
   - **whole weekend** / terve nädalavahetus
   - **many days** / mitu päeva
   - **1 day** / 1 päev
   - **a few hours** / mõned tunnid
10. **How do you usually move to different holiday destinations?** / Kuidas liigute tavaliselt erinevatesse puhkekohtadesse?
    - **car** / auto
    - **bus** / buss
    - **train** / rong
    - **bike** / ratas
11. **What is the most pleasant beach in Estonia?** / Milline on kõige meeldivam rand Eestis?
12. **What is the most pleasant hiking trail in Estonia?** / Milline on kõige meeldivam matkarada Eestis?

13. **What is the most pleasant bog in Estonia?** / Milline on kõige meeldivam raba Eestis?
14. **What is the most pleasant place for an active holiday in Estonia?** / Milline on kõige meeldivam koht aktiivseks puhkuseks Eestis?
15. **How has COVID-19 pandemic affected your habits in nature**? / Kuidas on koroonaaeg mõjutanud Teie looduses viibimise harjumusi?
16. **Please indicate which of these seven diagrams best describes your relationship with nature. How connected are you to nature?** / Palun märkige ära, milline neist seitsmest diagrammist iseloomustab kõige paremini Teie suhet loodusega. Kuivõrd seotud Te loodusega olete?

Appendix 3. Photos

Use of attractions on different beaches:



Author's photos.

Use of signs/boards:


Author's photos.

Use of watching towers:



Author's photos.

Appendix 4. Non-exclusive licence

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    1.2. digiarhiivi DSpace lisamiseks ja
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